WARSHIP EFFICIENCY IN A CHANGING ENVIRONMENT

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NAVAL POSTGRADUATE SCHOOL
Monterey, California

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WARSHIP EFFICIENCY

IN A CHANGING ENVIRONMENT

by

Roald Gjelsten

September 1978

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In the course of the last few years the main attributes of the conscripted sailors summoned to serve their compulsary time in the Royal Norwegian Navy have changed substnatially, especially regarding level of education and attitudes toward formal authority. Similar developments have taken place in the Norwegian society at large during this period while the mission of the Navy has remained approximately the same.

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by

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Lieutenant Commander, Royal Norwegian Navy
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Submitted in partial fulfillment of the
requirements for the degree of

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In the course of the last few years the main attributes of the conscripted sailors summoned to serve their compulsary time in the Royal Norwegian Navy have changed substantially, especially regarding level of education and attitudes toward formal authority. Similar developments have taken place in the Norwegian society at large during this period while the mission of the Navy has remained approximately the same.

This study describes and discusses various approaches a commanding officer of a frigate in the RNoN could choose to establish an effective unit under present individual and societal circumstances; the difficulties he is likely to experience and decisions he has to make, when attempting to adjust traditional patterns of leadership philosophy and style to match current challenges.

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TABLE OF ABBREVIATIONS

Abbreviation	Meaning
A	Autocratic
C	Consultative
CO	Commanding Officer
G	Group
LPC	Least Preferred Co-worker
MBO	Management by Objectives
NAVREG	General Regulations of the Royal Norwegian Navy
OD	Organizational Development
OOW	Officer-of-the-Watch
XO	Executive Officer

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I. INTRODUCTION

Since the mid-60's a substantial change has taken place in Norwegian society with regard to many inherited values whose function and purpose were never questioned in earlier days. Traditionally, persons in formal positions were respected and often feared for their authority and the administrative powers they held. However, the attack on formal authority in general and the introduction of ombudsmen have brought about a strong decline in the respect for and hence the power of holders of administrative positions. For the military establishment, this means that those in superior positions are also being evaluated and judged on merit by their followers. For those who do not have the professional skills and leadership ability required to be accepted as the natural leader, formal position is viewed as being of limited value as a platform from which to lead effectively if respect and confidence in the leader are lacking. Blind obedience to orders given by such a person can no longer be relied upon as a substitute for proper leadership qualifications. These trends have forced Naval officers to change or adjust traditional patterns of their leadership style.[27] When making programs or determining sources of action much more serious consideration has to be given to welfare factors and regulations than previously. Some of these changes have been formally established through Navy regulations. They are often

based upon negotiated agreements between representatives of officers, enlisted personnel, and the Government.

The conscripted men[1] also have their elected representatives at local and central levels to take care of their interests, but they have no negotiating rights.[17] In addition, an independent ombudsman guarantees administrative fairness and equal treatment to all categories of personnel. He reports directly to the parliament.

In many cases the different representatives have a formal right to be consulted in administrative matters. This sometimes provides better input but from the officer's point of view at least, quite frequently it requires far more time and resources than the problem deserves in terms of efficiency.

Besides, more rigorous administrative requirements could lead to a strengthening of bureaucratic tendencies and a weakening in the utilization of initiative that is encouraged in the personal development of the individual officers of the Navy. This is quite a serious effect since bureaucratic minds are not noted for forceful and innovative leadership which most certainly is needed in time of war.[40] Preparing for war, of course, remains the basic mission as always for any unit commander despite changes in the peacetime environment. He has to make his best effort to establish and maintain the highest possible level of fighting preparedness the resources given to him will allow.

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[1]Norway has universal conscription.

This task has become more and more difficult and complicated. Among other reasons this is caused by the fact that his authority is steadily diminishing due to the introduction of more and more formal structures as described above. On the other hand, the complexity of military procedures, operations, and maintenance requirements has tended to increase. Hence, the need for efficient administration and leadership is imperative in order to realize the potential of men and systems. Furthermore, a change in the cycle of deployment of Navy units has recently been imposed. For years a three-month workup period began the cycle when the new contingent of drafted personnel arrived after having completed their basic military and system training. For the following nine months, the unit remained in operative status until a new crew arrived, and the cycle started all over again.

In order to extend the period of operative deployment, a new policy has been adopted. Officers and enlisted men are kept usually for one to three years, while one-fourth of the drafted personnel are replaced every third month. This scheme, of course, requires a completely different approach to the planning and conduct of training cycles than heretofore. In order to meet these challenges the Royal Norwegian Navy has carried out a program of seminars for all categories of Naval officers.[2] The subjects include group behaviour and organizational and communication theory. A follow-up program in organizational development has also been given to selected groups of officers. At the same time the required courses in these fields have been increased substantially at the Navy's educational establishments.[15]

However, most of these programs have been given in the terminology of the university scientist or in the context and language of private enterprise. This fact has left considerable confusion among participants. Officers are feeling insecure about integrating their acquired human behaviour concepts with the practices of traditional Navy leadership as they have learned it. In other words, the officers of the Navy are in a transient state of adjusting their customary leadership style towards new schemes that are thought to be better suited to help leaders deal with current challenges efficiently.

In this situation it is of importance to recognize that values and customs change continuously in a society. However, rigid structured organizations, such as the military, often have a limited ability to respond to outside developments.[4] When the gap between the surrounding society and practices within the military grows too far apart, an adjustment has to take place.[53] In order to avoid painful, disruptive steps, the military has to learn to be more observant and responsive. The faster the environment changes, the more flexibility is required towards rapid responses to avoid unnecessary conflicts and agony. As tension builds up, outside interference is almost certain to be experienced if the Navy fails to respond adequately. Imposed regulations will create uneasiness among the professionals of the Navy and will probably reduce the level of performance, at least temporarily. At the same time, there is always the danger of reduced rights to self-determination in internal matters when lack of ability to handle the situation

is demonstrated. On the contrary, if the Navy can prove to have the necessary awareness, well planned and gradual implementations may improve readiness and strengthen the autonomy of the Service.

II. THE PROBLEM

A. NATURE OF THE PROBLEM

The purpose of any Navy unit is to obtain and maintain the highest possible level of combat readiness. To reach this goal is a complicated task with many interrelated variables to be considered. To be successful, it is necessary to design a sociotechnical system that meets both the organizational requirements as well as the needs of the individuals in the most optimal way.[19, 25] Fortunately, considerable knowledge is now available that may facilitate the task and possibly make it easier to obtain satisfactory results if the insight is utilized properly.

In this study our point of view will be that of the Commanding Officer (CO). This approach seems quite natural since the ultimate responsibility always rests with the CO, formally and morally.[31, pp. 308-312; 49] Hence, the objective is to propose models within which it is possible for a Commanding Officer of a Navy vessel to understand his unit in terms of main variables and their important interactions. This would better enable him to systematically experiment with situational variables by applying social sciences knowledge and proven administrative techniques in combination with the traditional experiences of the Royal Norwegian Navy.[49] The aim is to recognize structures that might help the CO to evaluate situational variables as accurately and realistically as possible.

More profound understanding of which factors at play are likely to be the important ones should increase his awareness and enable him to find adequate means within the frame of his authority to maintain and improve output.

Since the technical system of a specific type of warship is given as fixed and the output requirements change very little over a few years, the fighting unit is described by a yearly cycle. Once each year the main bulk of the crew will be relieved. New officers and men arrive and basic training has to start all over again. It is common to state objectives, plan exercises, and evaluate performance in terms of time elapsed since the major portion of a ship's crew arrived. This measurement could be called crew maturity and the unit is usually a month. Main variables in each phase do not vary too much from year to year except for the personalities involved. In the first weeks for example, quite a few of the "freshmen" will experience difficulty in adjusting to the warship environment. Other phases create different problems.

Systematic attempts to identify significant variables, and possibly classify their relative importance in various situations and phases, could provide a useful analytical tool for the CO in his diagnostic efforts. The main objective of this study is to try to establish a meaningful structural frame for such discussions. However, due to the variance in personality, values, style, and ability in different circumstances of the various leaders as well as that of their group,[19] it is more than doubtful that any type of close to controlled experiments

can be carried out.[20] It should also be stressed that it is hard to develop normative rules that can accomplish much more than to recommend that the CO is aware of and alert to certain indications in areas which are commonly known to cause problems. The number of variables and complexity of interactions prevent the establishment of "correct" solutions. Optimality often has to be found by weighing the need for a technical "best" solution against the necessity of acceptance when considering the implementation phase.[52] Realistically, the most to be hoped for is that more valuable learning will result from experiments when a reference is available in the form of a theoretical model. Furthermore, the vessel itself can be viewed as a physical model. In addition all activities and variables can be looked upon as events and attributes, respectively, in an identity simulation of the actual model.[20] In summary, the CO's problem is (1) to observe results and interpret their significance (which is not an easy task when using identity simulation) and (2) to utilize the insights gained to improve output.

B. ASSUMPTIONS

Throughout the study a frigate will be the unit to be modelled. All discussions have to be understood in the context of this reference. Based on that and the considerations given above in section A, the following assumptions will be made:

1. The frigate as a technological system is given. This means that shortcomings in design of man-machine systems such

as lack of compliance with human factor principles will not be considered.

2. Identity simulations are always carried out on a man of war.[20] Successful experiments are repeated and knowledge of such results are passed on and finally written down in the Navy Regulations (NAVREG) as guidance to be followed.[49] Hence, in the Navy context many of these recommendations ought to reflect sociological axioms.

3. Maximum efficiency occurs when the satisfaction of individual needs are not in conflict with the requirements to fulfill the organizational goals of the frigate.[19]

C. OUTLINE AND SCOPE OF STUDY

This study is based upon the assumption that the CO can be viewed as a person in charge of a real life simulation experiment which in the simulation theory is called an identity simulation.[6] The study will be done by literature research in combination with the application of the author's experience. The analysis will be conducted as follows:

1. Background Factors

Attributes of the main social categories and their subsystems are discussed. Next, the formal structure of the frigate will be presented, followed by a discussion of some additionally selected factors.

2. Modelling the Frigate

First a system levels model is used, secondly a socio-technical system is described.

3. Applying Additional Theoretical Support

Selected areas of communication and leadership theory will be briefly discussed. Examples of how such knowledge can be applied will be given. Furthermore, models of the goal and decision processes will be presented. In addition, the prospects of participation will be discussed with reference to the rigidity of required organizational structure in various readiness situations. Finally, a model of the use of educational goals will be considered in the organizational context of management by objectives.

4. Time-Based Analysis

On a chronological basis, the models and discussions presented earlier will be used to identify and describe variables regarded to be of particular importance at each phase of crew maturity. Based upon the analysis and recommendations found in the NAVREG and considered to apply to the situation, some normative suggestions will be put forward.

5. Summary and Conclusions

A broad overview of the most important considerations will be provided. Likewise, some concluding remarks are intended.

6. Appendix

An appendix will be supplied comparing the usefulness of the two leadership models utilized most in this study. The theories are the Fiedler[19] and Vroom-Yetton models,[51] respectively.

III. ANALYSIS OF THE FRIGATE AS A SYSTEM

A. BACKGROUND FACTORS

When starting to discuss and analyze the variables of the model as a man-machine system it is necessary to outline the factors making up the basic skeleton which has to be taken as a given for the frigate.

1. Social Groups of the Royal Norwegian Navy (RNoN)

Onboard a frigate we will roughly have two main categories of crew members, officers and ratings. Within each of these some subgroups can be identified.

a. Officers

The officers may be classified in different ways. From a potential conflict of interest point of view, it is probably most enlightening first to look at educational background. Basically, one group is Naval Academy educated. These officers have completed four years of training at the Academy. Entry requirements are gymnasium or equivalent (approximately two years of junior college).[50] They are educated and trained in three distinct specialties: line, engineering, and supply, and they serve in accordance with these designators throughout their Navy career.[48] However, the line officers specialize further by so-called "long-courses" (six to nine

month duration) into gunnery, antisubmarine warfare, communication, etc. There is also some specialization through service experience, such as being primarily a frigate man, a submariner, a mine-warefare expert, etc. However, most officers serve at least in two different types of ships such that a submariner usually also will serve on frigates sooner or later.

There is also another type of officer coming from the Naval Academy. Candidates with Merchant Marine College education and graduates of Technical Colleges and other schools with science curricula are given a short, one-year, officer candidate type training before being commissioned as reserve officers. College graduates may later qualify for career status. The Commanding Officer (CO) of a frigate, and sometimes the Executive Officer (XO), will usually be a War College graduate as well.

The other group of officers are those who until the previous year were the petty-officers. They are graduates of the Sea Military College. Minimum entry requirements vary from specialty to specialty, but gymnasium is not necessary. Depending on educational and vocational background, the basic training lasts two to three years before becoming a non-commissioned reserve officer in one of the seventeen different branches.[48] Those who are qualified may apply for the upper level course which lasts approximately two years. For most branches, the students enroll for the two last years at three-year technical colleges. Upon graduation they are commissioned as ensigns and become members of the technical officer corps.

Besides being responsible for maintenance and repair of their equipment, they are also highly trained operators within their field of specialty.

Some unrest has followed the change of rank for the technical officers. Younger Naval Academy officers have seen their traditional status and power-positions being threatened by this development. As a result, all officers now receive orders from the Navy headquarters to a specific job or position. In the past, many officers were ordered to a ship and the CO assigned them to duties at his discretion. Nothing much has changed functionally. As before, Naval Academy graduates will usually be the department heads, the technical officers and junior academy outputs and reserve officers will serve as division officers. Sometimes, however, the department head may be junior in rank and seniority to some of his division officers. This might be a source of conflict, but more often than not it works fine and the formal organizational position, alone, determines command authority.[49, 102.4] Senior technical officers will also frequently be department heads.

The upgrading of the petty officers to officer status was a political move, but mostly a consequence of the general trend in the society aiming at tearing down what is regarded as unnecessary social boundaries. When new ships are constructed and living quarters planned in accordance with established rules, it is unlikely that this factor will create any problems worth mentioning in the future.

b. Ratings

In Norway all men are called for screening examinations for military service at the age of 19. Some 8.5 percent are found unfit to serve, the rest of the approximately 30,000 is conscripted and about 4000 have to serve 15 months in the Navy.[39] Of those, 2700 qualify for sea duty. According to the Norwegian constitution it is both a right and a duty to do military service.

It is a challenge that everybody has to serve since not all are equally positive towards spending the compulsatory 15 months in uniform. Young people are slightly less favorable in their attitude towards the military than older people. Hence, a recent survey (Table I) showed the following opinions among Norwegions regarding perceived need for military defense.[21]

TABLE I

NORWAY'S NEED FOR MILITARY DEFENSE

	All ages	15-19	20-29	30-59	60
In favor	79	64	78	80	81
Against	7	11	9	7	5
Don't Know	8	12	7	8	8
No opinion	6	13	5	6	7

Another gallup conducted within and by the military services compared the expectations of screening candidates towards their military service with the attitudes and opinions of recruits and veterans, respectively. The data was collected

in 1966/1967. A tremendous amount of change has taken place since then within the military, so the results may not apply very well to the present situation. However, some conclusions are found to be interesting and will be mentioned:[1]

- approximately 48% looked forward to do their military service as opposed to 13% that were really worried.
- 65% said they would do their best, 3% intended to do the least possible.
- 37% of the recruits liked the military service quite well as opposed to 21% of the veterans. 38% of the recruits had no strong opinion. 35% of veterans had the same meaning.
- 28% stated that they liked themselves better than expected, 40% as they had anticipated, the rest worse than they had thought.
- 10% indicated that they had serious difficulty in adjusting to the military environment, 39% had experienced some problems, the rest none.
- 95% said they enjoyed being with their buddies and 57% liked their officers quite well.
- ability to adjust to the military environment and find satisfaction in the service increased significantly with level of education.

Since 1967, the developments in the educational sector have been explosive. Secondary, vocational, college, and university training have increased substantially. Likewise, goals and methods have been adjusted to meet the challenge of such reforms as that of the Industrial Democracy Act (which requires and guarantees workers to be represented by elected members on the board of industries and firms). To prepare

---

[1]Internal Armed Forces reports and studies.

students for such tasks, all categories of schools emphasize group work and also have a varying number of required social science courses in their curricula. The implication of this is that the average soldier is quite educated theoretically or highly trained vocationally. Besides, many of them have been on school boards or participated in political or organizational activities. Hence, many Norwegian ratings are quite used to have a saying in matters concerning their situation when they enter the military service.

In addition to the conscripted ratings, there is also a group of volunteers that enlists for a minimum of three years. At the end of the contract period they may reenlist for another three years or they can apply for further training to become technical officers if they qualify. There is also an option to renew the contract for a third period. These ratings are quite well paid, and they accumulate a substantial bonus that is paid in cash when leaving the service or it may be given as a monthly payment for those enrolling in schools or colleges. The number of years paid for depends on the time served. The volunteers also have their own uniforms that are different from those doing compulsory service. On the average, the educational level of the men on contract is slightly lower than that of nonvolunteers who are found fit for sea duty. However, personnel in this category are very useful. They provide continuity and a higher level of experience. Therefore, volunteers are important members of the crew, especially towards the end of their first period or after reenlistment. The basic system of training is the same for all in the same specialty,

but those on contract often get additional professional education later. This is typical if they are in a specialty such as radar, sonar, and operations. It is also quite common that the volunteers who have no adjustment problems and take liking in their occupation, identify more strongly with the Navy as a serviceman than do ordinary conscripts. Those who cannot comply are usually discharged before the end of their contracts. They then lose their whole bonus, so they have a strong incentive to stay straight. The volunteers usually constitute a high status group among the ratings due partly to seniority and partly as a result of well-filled pocketbooks. Most of them are single and big spenders during harbor visits.

Not considering the formal groups, status among ratings is earned through seniority. The veterans (three months left to serve or less) rule jealously. And they have no mercy with freshmen who do not comply according to their norms. Usually, social sanctions are enough to line up most challengers. However, the veteran rules apply only in certain situations such as having the best tables for meals, some extra "goodies" for their sandwiches, the right to join the line in the front, reserved seats for TV, etc. The formal groups are more important for developing friendship and identification and, hence, are a basis for efficiency.[1]

---

[1]The main input to this section is based upon the author's experience as an apprentice (cadet-living among ratings), midshipman, and officer.

Summary

Some of the main subsystems of the ship have been described. The social hierarchy includes officers and ratings. The officers can be subdivided by education into (1) Academy graduates of three main categories and (2) technical officers with more specialized technical and vocational training in 17 specialties. Among the ratings the volunteers serve for three years, the conscripted for 15 months.

2. The Formal Structure of the Frigate

In classical or bureaucratic terms organizations are described as hierarchies. A superior has formal or legal authority which he delegates to those of his subordinates reporting directly to him. In turn they pass authority to their next level subordinates. This is the type of organizational view that is called military and associated with a pyramid structure.

When viewed formally, the organization of the frigate, as seen on a chart mapping the interaction among the functional groups of the system, fits this model quite well. Certain aspects of the ship's functional organization will be treated next.

a. Functional Groups

The functional organization of the frigate is shown in principle on Figure 1.

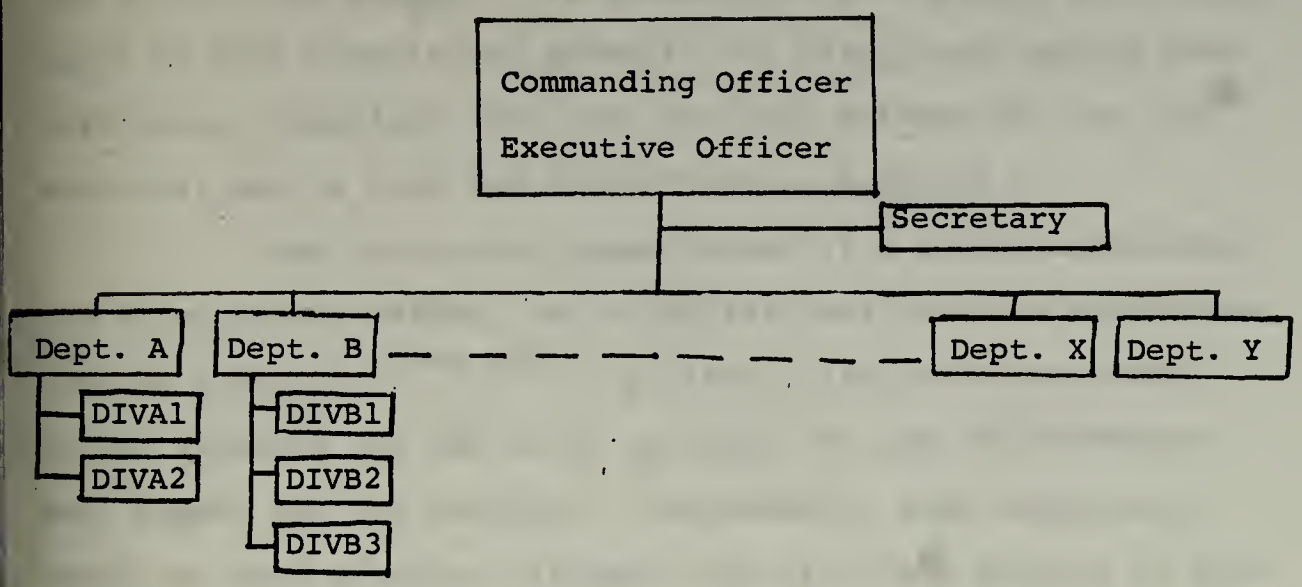

Figure 1. Functional Organization of the Frigate

The ship is divided into departments under the Commanding Officer (CO) and the Executive Officer (XO). Formally the department heads report to the XO except in some rare exceptions. An example of the latter is when the Navigation Officer reports directly to the CO in matters concerning the navigation of the ship.[49] Usually the XO also carries the extra title "Head of Exercise Planning and Coordination." It is in the frame of departments and divisions that the basic training in operation and maintenance of weapons and systems are planned and conducted. As a rule ratings are assigned to quarters according to division, and the individuals usually are identified and referred to as members of their division. Combinations of divisions and departments may also serve as a

reference group on occasions. Traditionally, it is the case that there is a sort of competition or show off between deck and engine crew members. In interaction with people from other units or with nonmilitary persons, the ship itself is the main reference. Sometimes, the unit the ship belongs to, say the squadron, may be used for identification purposes.

The functional organization is a strict hierarchy, and as explained before, the organizational position determines command authority.[29 § 102.4] It should also be noted that it is not uncommon for the XO to be junior to one of his department heads, say the engineer. Furthermore, some department heads may have division officers that are their seniors in rank as well. However, the most common situation where juniors command senior officers, happens when relatively young line officers serve as officers of the watch at sea.

b. Operational Organization

In order to utilize the ship as an integrated system, there are several different operational organizations. Which one of them that will be in force depends entirely upon the situation. When combat action is imminent, the highest level of readiness, "action stations," is ordered. Then, all members of the crew are on maximum alert in their prime combat roles.

The next level is a two watch system. The crew is divided between the King's and the Queen's watches.[49] Depending on the mission, all systems are half manned or some

systems are fully operated with others only partially activated or at stand by.

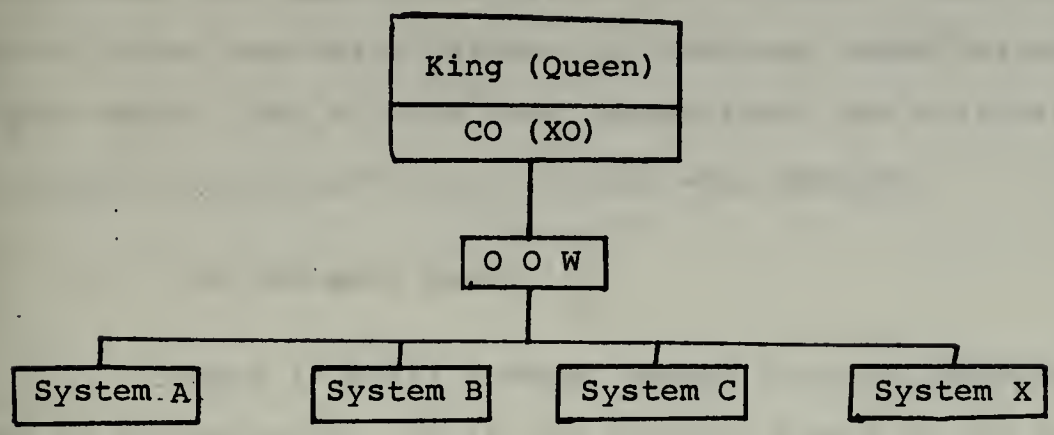

Figure 2. Functional Organization of the Frigate - Two Watch System

As shown on Figure 2 the CO is in command of one watch, the XO of the other. Most of the time the Officer of the Watch (OOW) will be in charge and only report intentions to the CO/XO. A majority of OOW will run the operations from the combat information center (CIC) and will have an assistant in control of safe navigation on the bridge. More often than not the CO/XO will also stay in the CIC. Under more relaxed circumstances, a three-watch system will be utilized. The OOW will be in charge and he will often find it suitable to be on the bridge with his assistant. If there is a third officer on duty as assistant to the OOW, he will be in command of the CIC activities. Ordinarily, no weapons are operated, only detection systems such as radars, ECM, and sonars are activated.

Seamanship activities such as boat drills, man-overboard exercises, emergency rudder procedures, etc., are trained when the three-watch system is in force. When in harbor the red, blue, and white watches, as they are named, alternate as duty watch. Due to work hour regulations, the officers are not always on post with their watches when secured.

c. The Advisory Board

There is still another formal group of some importance to be mentioned. It is the advisory board to the Captain, or directly translated, the Board of Spokesmen. Each department has its elected member, and the officers have their own representative. Formal consulations with the Captain have to be held at least every fourth night. An agenda is prepared and distributed before the meetings take place. The non-officer members are entitled to brief their "constitutency" during work hours after each meeting. A formal minute is written and a protocol is kept of the proceedings. A copy of the minute is posted, and other copies are sent up the chain of command and to some other institutions including the Ombudsman of the Armed Forces. The rating representatives elect a main spokesman among themselves. He is their coordinator and works closely with the XO and/or the CO to prepare agenda and meetings. He has his own office. Many XOs also use the board members for informal consultations specially in matters concerning welfare and sports. The board has to be consulted or informed before action is taken in certain administrative areas. In some explicity defined aspects of

welfare the board of spokesmen has the right to decide. However, the CO may veto if he disagrees. Implementation is then temporarily postponed until the dispute is resolved by competent authority. If the CO's objections are accepted, the case is finally overruled. In addition, the regulations encourage the CO to delegate additional authority to the board in matters he finds fruitful whenever possible.[17]

Summary

The ship is organized into a functional organization of departments and divisions for training in the operation of weapon systems and for maintenance. Operationally, the ship is divided into watches corresponding to different levels of readiness.[1]

The Board of Spokesmen is an advisory board to the Captain. Members are elected on the basis of department representation. In some specified areas the Board has decision authority or the right to be informed before action is taken.

3. Other Background Factors

In recent years the importance and influence of the officer's "unions" have increased substantially. There are several competing for members. The volunteer ratings also have the right to organize. Formally, the unions are supposed to restrict themselves to negotiate salaries and deal with

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[1]For a broader, general introduction to naval warship organization and administration, see: Ship Organization and Personnel, Fundamentals of Naval Science, Naval Institute Press, 1972.

questions related to working conditions. The latter includes regulating work hours, establishing standards for quarters, and health and safety matters.

The Armed Forces in Norway are organizationally integrated at headquarter levels. Hence, regulations that emerge as a result of negotiations between unions and the Department of Defense tend to be standard. Since the Army is the largest service, more often than not it is the model. As a result, the work hours rules created numerous administrative and operational problems for the efficient running of naval vessels when they first were introduced. They have since been renegotiated and are no longer an operational problem per se.[1] But the compensations that have to be paid for lost free time put a severe practical limit upon time spent at sea. Under ordinary peacetime circumstances the consequences are that this economic constraint effectively curbs any sailing during weekends if it is not operationally required or if it has not been approved in advance by higher authority for participation in major exercises. The ratings conscripted to serve have no right to organize in unions. But representatives are elected to present their problems at consultative spokesmen conferences held at regional and central levels of military commands.[17] The basic idea is that information about grievances will emerge, and that the participants can develop solution alternatives during group work sessions. It is also an opportunity for politicians and the press to meet the soldiers and listen to their debates. An important mission at the annual main conference is to establish priorities among demands. The conferences

also elect the members of a coordination board that is in charge between conferences. This board chooses from among themselves a permanent work group whose members serve at the Department of Defense on a full time basis.

Even though the conferences, as well as the centrally placed coordination board, only have advisory status, their work group often has lobbied forcefully within the Department of Defense as well as with members of the Defense Committee in the parliament. At any rate, a large number of reforms have been introduced. Welfare improvements in the form of increased number of paid, long weekend tours home have been granted. A slow move towards rigid work hour regulations for conscripted personnel also seems likely to be realized before long. This tendency has been strengthened through the newly passed "Environmental Law"[32] which regulates strictly overtime and nightwork in industry. So far the Armed Forces are exempted from the Law, but even if partially implemented it may add severe constraints largely due to increased cost and administrative complexity. In general, to operate efficiently will require more personnel and hence more money. And as strange as it may sound, on ships far away from their homeport, staying in port from Thursday to Monday may not be what a majority of the crew wants, but that is what is regarded to be progress.

Another aspect that should be noted is that assignment of officers to department and division billets is done by a central office at the Navy Headquarters. Before the petty-officers were converted to officers, the Captain at least partially assigned officers to their duties. This new practice

was probably introduced to minimize local conflicts regarding who is appointed to be, say, department head, when two well-qualified officers are present. It might have created hard feelings if the CO decided on the junior one. But the Captain has obviously lost flexibility. If he finds it necessary to reshuffle his officers between departments/divisions, this is now quite a process. Those concerned have to be consulted and approval must be obtained before anything can be changed. Likewise, a rating is ordered to serve in his speciality. Hence, the rating's department or division will be specified.

However, if an enlisted man shows other interests and abilities, a transfer is normally not difficult to arrange provided the sailor agrees. Furthermore, any CO/XO has to keep in mind that the Chief of Defense has ordered programs to be worked out to give the ratings maximum possible opportunity to participate.[12] Therefore, it is important to find and implement procedures to meet this standard. It is not always easy even to discover suitable areas for such activities, because so much of what is going on is heavily structured. Participation is just not possible under such circumstances or at least not very meaningful.

Summary

The CO has to solve an optimization problem. He is given limited resources in the form of budget, human resources, and technical systems. In addition, he has quite a few formal requirements that must be observed, which further limits his options. Work hour regulations are an example.

B. MODELLING THE FRIGATE

An effort to integrate the various aspects of knowledge available in the literature and relevant to the frigate as a system is a major undertaking. It is not possible to do justice to all different approaches to organizational problems that can be applied on different system levels. Since the aim is to apply results of research findings to selected areas of interest, the descriptions of theories will be done as short as possible by summaries. The texts listed as references 28, 26, and 24 are recommended for general overviews. Furthermore, an introduction to and comparison between two of the most promising models of leadership, from an applied point of view, is given in Appendix A. The decisions regarding which factors should be emphasized are done somewhat arbitrarily. The selections are based upon knowledge of warship organizational problems in the Royal Norwegian Navy obtained from articles in periodicals and unclassified internal studies, but they mainly rest upon the author's own experiences and inclinations modified through discussions with a number of colleagues.

1. A System Levels Model

From a system point of view the frigate may be looked upon as an open system in interaction with the Navy and society. Internally, the social system of the vessel can be considered as consisting of subsystems of the individual, group, and organizational levels,[26] respectively, as illustrated in

Figure 3. The physical structure of hardware is considered a constraint.

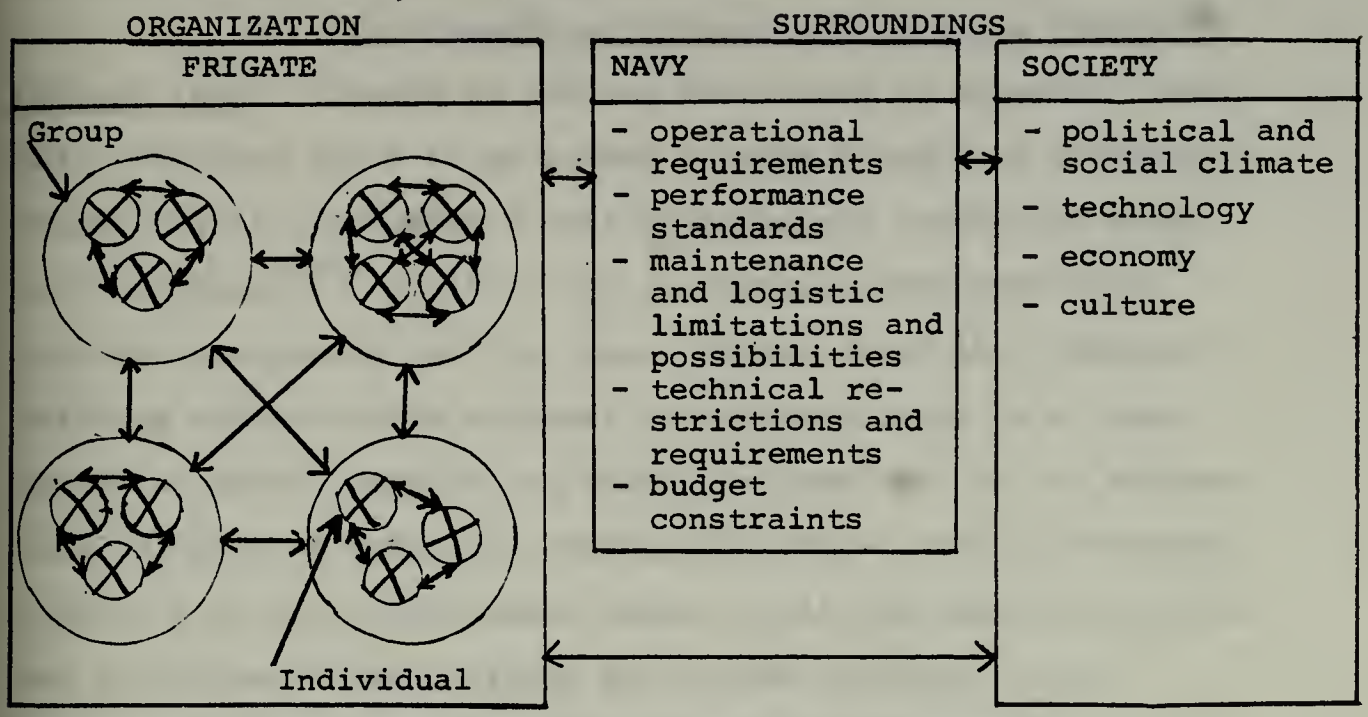

Figure 3. The Frigate Viewed as an Open Social System - Three Levels of Internal Subsystems (Interactions with External Environment Indicated)

a. Individual Level

A general characterization of members of the main social groups present on the frigate has been given earlier (Section IIIA). For all categories of personnel, their motivational status is crucial for the organizational usefulness of their efforts. If the individual's needs cannot be satisfied through behavior consistent with activities pursuing the goals of the organization, there is a problem. Such conflicts must be solved by adjusting the sociotechnical design so as to

meet both requirements simultaneously (Herbst, 1975) to obtain optimal organizational output.[25] Next, the factors that seem likely to be of importance for persons placed at different organizational levels in the systems will be investigated.

(1) The Commanding Officer (CO) and the Executive Officer (XO). Based on the two dimensions of separate leadership functions found to be needed to make group-work efficient, Senger (1971) hypothesized that a two-person leaderteam might be a solution.[43] Quite a few researchers have published findings suggesting such an idea. Senger found that commanding officers and executive officers indeed functioned as a team, providing mutual support and being complementary to one another. In a majority of cases the commanding officer mainly concerned himself with the relationship needs, while the executive officer was in charge of task related activities (Fiedler, 19 or Appendix A). But sometimes the roles were reversed.

Having observed executive officers change their roles in order to complement a new commanding officer, it seems reasonable to suggest that the commanding officer, either explicitly through consistent behavior, indicates his domain. Then the executive officer to the best of his abilities tries to provide the rest of the leadership activities needed. Depending upon the match of the officers' skills in their tasks and human relations functions as well as the flexibility exhibited in support of one another, the teamwork may turn out more or less efficient.

A complicating factor pointed out by Senger is that even though a complementary relationship is obviously needed

for successful co-management, most leaders tend to perceive the subordinate's (i.e., the executive officer) competence as a function of one's own personal value orientation.

Since Senger has shown that leaders consistently tend to rate subordinates who share their own value orientation higher than those who do not, we have seemingly a contradiction at hand. According to Fiedler the task-oriented person has the least ability to perform objective analysis of interpersonal relations.[19] Hence, the most likely case to occur would be for a CO with such inclinations to grade his relation oriented XO unfairly low on fitness reports. Given this guidance, many executive officers would tend to adjust their behavior in the direction indicated by the captain since feedback is a very effective reinforcer of behavior. Thus, having the XO abandon his role as social-emotional leader, the vessel would most certainly experience more dissatisfaction, discipline problems, and lowering of morale because of increased conflict between personal needs satisfaction and organizational goals for the individuals onboard. How should the Navy try to avoid such undesired developments? A combination of several factors which seem to be of importance might improve the average results. The Navy Regulations (NAVREG) formally establish different spheres of functional responsibilities.[8] If the commanding officer (CO) reduces the authority of the executive officer (XO) to an unacceptable level, the latter may fight back by referring to his instructions. Such an approach at least gives the XO powers that could prove beneficial to the overall efficiency by providing him with a platform

from which he may continue to carry out his functions despite poor relations with the CO. Knowledge of the need for dual leadership and the presence of perceptional bias in one's grading of subordinates could also help. A natural way to go seems to be case studies combined with role playing.

Another factor that might improve the performance of the CO/XO team, is explicitly stated goals. Then, not so much effort has to be spent resolving differences in perception of goals. Instead they can concentrate on the practical aspects of how to fulfill the objectives. However, if goals are to provide the guidance and incentive intended, the performance of the vessel has to be evaluated against this set standard. Then the feedback will be meaningful, and it will reinforce desired behavior. Linsay[34] has shown that the output produced by an organization is strongly affected by what inspectors are known to look for. Other areas of equal or greater importance are neglected because those factors are not being given any significant weight in the evaluation of the overall performance. In the context of the peactime frigate this might materialize in the spending of a disproportionate amount of time on activities such as cleaning, haircut, marching drills, sports or any other possible "pet area" of the CO or an inspecting flag officer. It is human when war seems far away that the personal goals of the CO, in this case his prospects for promotion, are taken care of first, followed by satisfaction of organizational goals when conflict occurs. Since a vessel will operate under the operational command of

different admirals, chances are that concurrent changes in priorities will take place. Quite a few of the "pet areas" might have only marginal value as an output from a strict combat readiness point of view. The XO will in few instances deviate from the COs priorities. If the XO fails to meet the standards expected by the CO or the inspecting flag-officer, most COs would be inclined to penalize such failure rather heavily.

It has certainly been indicated that it is of utmost importance to supply the Captain with the right incentives. A suitable approach might be to introduce functional teams of inspectors reporting directly to the officer who writes the Co's fitness reports. Such a system demands well-established, explicitly formulated standards for satisfactory performance within every specialty, system, and operational function at discrete points in time measured in, say, months since the majority of the present crew arrived (crew maturity). It would be a substantial task to establish the specific objectives necessary to omplement a goal-hierarchy system, but the prospects seem so promising that such an undertaking might be justified. It should not only help to minimize the conflicts between personal goals of the CO/XO and those of the organization, but it would also specify clearly to everybody on board what is expected of each one. It also provides a basis for fair and realistic feedback. Goal clarity and knowledge of own performance are both known to create good motivation. By emphasizing one groups and competition between groups, an

excellent condition for favorable within group development should emerge. If group members identify and use their own group as a reference, very strong relations should result.

It has been shown that an individual's commitment to the norms, needs, and requirements of his primary group is the single most important factor contributing to development of a person's fighting efficiency and endurance.[16] This is, of course, only the case as long as there is no problem in integrating the behavior required to pursue the organizational goals with satisfaction of personal needs. Having examined the general motivational situation of the CO/XO, the next group of individuals to be considered are the remaining officers.

(2) Other Officers. With a high degree of confidence it can be assumed that the officers as individuals are strongly motivated to do well. But lack of clearly stated goals, inconsistency in the importance of organizational objectives, and behavior being positively reinforced through fitness reports or other types of rewards may create conflicts analog to those experienced by the CO/XO. It will again be impossible to work efficiently for the advantage of the unit and at the same time obtain maximum personal benefits. However, the use of detailed objectives as guidance could again prove helpful and ensure:

(a) security (what is expected is explained and known)

(b) meaningful feedback (the standards required is explicitly spelled out)

(c) relative independence to establish leadership in own area of responsibility since the aim is given, but not the instruction of how to arrive there)

(d) motivation through constant feedback about own performance as well as the inspiration that follows from competition.

Concerning the officers, the CO/XO team will provide the most important source of feedback, but their evaluation has to be modified to comply with the presumably more objective and prestigious judging of the team of inspectors. This fact enlargens the independence of the officers somewhat, since it would be difficult for a CO to justify a downgrading of the performance of an officer he has had some professional disagreements with if the inspectors give him and his crew top ratings. The most likely thing to happen is that the CO would change his opinion because top scores in any division or function is very beneficial for him, too. The system with inspectors will, therefore, probably tend to diminish evaluation based on purely non-professional criteria, since a number one officer in the eyes of the CO is quite likely to drop in status if he is rated low. Again, the important aspect to remember is that all obstacles that prevent an officer from working for his own best interest, when putting maximum effort into reaching the organizational goals, should be removed or at least minimized.

Another factor that would most certainly help motivate officers would be the introduction of qualifying exams for an officer-of-the-watch certificate. The CO should retain some authority in this field by approving the practical parts of the test. The theoretical subjects could be covered either through stated objectives and self-studies (correspondence, PSI), a system course, or a combination of all. Similarly, a required qualifying system course to become CO would probably also contribute to an increase in overall professional standard and ought

to be considered. It is difficult to accept that such a scheme is necessary only for submariners.[1]

(3) Ratings. Due to the involuntary aspects of universal conscription, much reluctance and often negative feelings can be experienced among the individual sailors. This sometimes surfaces in aggressiveness and a negative attitude towards officers, the Navy, and the armed forces in general or as violent actions against fellow sailors to dissipate some of the accumulated frustration.

A main problem is, therefore, to change the behavior of negative elements and to prevent or reduce their possible influence on others. As for the officers, this can only be done when it is possible for the ratings to find a reasonable degree of satisfaction of individual needs while being a productive team member. As explained before, the young men come from all backgrounds, and they have quite different references to guide them. But they all seem to have a strong common wish to resist the ultimate effects of uniformity. Therefore, it is important for most of them that they are now allowed to wear civilian clothes on shore-leave except on special occasions. This gives them an opportunity to relate to their former member groups which usually serve as their reference group as far as fashions and behavioral values are concerned. Talking individually to crew members displaying

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[1]There has been a qualifying course for COs of submarines for many years in the RNoN.

negative reactions might surface some indication of their problems. In many cases a solution can be found, and the sailor could become a valuable member of the team and sometimes be very grateful to the officer who helped him out.

Assuming that the basic physiological needs are always taken care of, one would imagine that security and safety needs would be very important when arriving in an unfamiliar situation. This should indicate that an emphasis on explaining the norms and standards required in detail to everybody would be most helpful in the adjustment process. Nobody likes to be laughed at or regarded a fool because he does not know some of the rules which are important onboard a ship but different from norms followed in other places. In general, humans adjust rapidly. If not properly guided, the newly arrived will develop norms of their own, some of which might not work to the benefit of the organization. This aspect will be considered further in the next section about the group level.

b. Group Level

The group has already been emphasized in the discussion of the individual level. However, the group seems to play such an important part in the establishment and maintenance of fighting ability that some of its attributes have to be investigated further.

To illustrate the importance of group coherency, a British study after the war investigating the unbelievable

discipline displayed by the Germany Army towards the end of World War II, when it was obvious to everybody that defeat was certain, revealed that the explanation probably had to be found in the brickstone group structure of the units.[5] Each squad was composed of soldiers from the same village, countryside, or big city street. The platoons and companies were then built up by neighboring streets or their equivalents. The noncommissioned officers were all from the same district, speaking the local dialect of their soldiers. In the defense role, the units would also be assigned to defend their own regions, which meant their own homes, relatives, and communities. The important aspect of this practice, apart from making it easier and faster to develop group coherency due to common values, was that performance during combat incidents was not only motivated by the need for maintaining status in the group, survival, care of friends, and self-respect but also because of the fear of losing respect and status in the local community after the war was over for failing to have performed as expected of a German soldier. When resistance stopped, it was the group that surrendered, not individuals. This example shows the importance of how members of a group are selected. Since Norway has universal conscription, schemes have been developed to ensure the best possible use of the manpower available.[13] The procedures have recently been revised. Besides physical fitness and psychological aptitude tests which divide the recruits into combat and noncombat categories, a few other attributes are used for further classification. The most important ones are

intelligence and aptitude tests (profiles for abilities in science and mechanical skills), level of education, work experience, and special skills. The attributes of the individual are then matched against a list of required ability attributes for the different Army, Navy, and Air Force specialties, taking into account whenever possible the recruit's choice of service.

Assuming that the specified requirements are adequate and that those assigned to the frigate in the various positions meet the specifications, what then are the special characteristics of the shipborne groups?

Compared to a work group where, for instance, the members are only together for eight hours per day, five days a week, the formal group on a ship requires individual participation and interaction with other group members 24 hours a day as long as the person stays onboard. The individual is deprived of normal privacy in the way he knows it in civilian life. There is no place to withdraw, either to a family or to a sparetime activity, quite apart from the work-related situation. On a warship the quarters are so modest that few private secrets can be kept. The formal group works together and has quarters together. Therefore, more often than not due to the sociological axioms of proximity and frequency,[16] the formal group will develop into a primary group. As opposed to a secondary group where membership is sought for a specific purpose such as dancing or golf, a primary group is characterized by members showning their true and unmasked feelings and personality characteristics including fear, anger, ambitions, prejudices, stereotype, joy,

etc. Hence, a very crucial point in building a basis for effective teamwork is the development of a common reference group from this collection of individuals. First, a common goal must be anticipated. According to Navy Regulations,[49, § 247.2] the prospects of having to sacrifice their own lives should be explained to the crew's sailors. Next, they should learn to appreciate the importance of every one's contribution to ensure a successful outcome in combat situations. Third, they should in detail be explained the purpose of their own jobs and the part they constitute in the overall design of the ship as a fighting unit.

The officers in charge of the divisions and departments must work very hard and be determined to lead the internal group processes in the direction wanted. They have to take active part in the training program so they can respond to the needs of their group members without delay. By observing they can also learn much about who is doing what within the division. This might guide them well, when time comes to select leading seamen. Negative elements may be spotted and given special treatment. Specific assignments may help to motivate them. By somewhat ignoring poor performances that are not so grave that negative action is absolutely necessary and praising jobs well done, the effects of positive reinforcement may work, but it is always a slow path to follow. However, manpower is a scarce resource in Norway, so anything short of a best effort is difficult to justify. Competition between groups can prove useful in the context of within group development, when applied

with care. If each department and division as well as the different watches get assigned a certain amount of points considered appropriate as an indicator of relative contribution to overall combat effectiveness, the total sum of points might be used as an approximate measure of effectiveness. It should also be possible to earn extra points through accomplishments in support areas like welfare and sports. If the ship has, say, a unit newspaper, an excellent soccer team or can demonstrate activities in similar areas, additional points should be given to the ship. It should also be possible to reward overall properness and smartness in military bearing with some plus points. For example, by assigning equal amount of points to say red, blue and white watches, there is an excellent opportunity for intergroup competition in seamanship skills at sea as well as watchkeeping abilities in harbor. Furthermore, if a system of external expert teams is implemented and they grade on an absolute scale, sonar crew on vessel A may compete with equivalent division/department members onboard frigate B in the same combat unit. And by adding up points ships may compete, and so can divisions or squadrons. There may be a "best frigate of the year" trophy, but only to make the results known may provide the feedback and inspiration needed to improve efforts.

It has been indicated that the active and considerate participation by the officers in the program of their groups could serve the purpose of strongly reducing the probability that group norms contradictory to the fulfillment of organizational objectives are established. Besides the possibility of

earning them respect and trust, this approach could enable the officers to sense emerging conflicts at an early stage. Hence, problems can be solved constructively if the leaders take part and stay aware. Furthermore, the group development process is not disrupted.

In general, involuntary service often implies that there is no great enthusiasm for their situation as crew members. Therefore, friendship and security in their formal group are a necessity for many conscripted sailors. If they fail to be accepted or do not find any affiliation in their relations with the other group members, it is often very difficult for them to adjust. Within groups harmony and mutual support might be the most valuable asset that the ship can offer a sailor. If this quality is lacking life might become very difficult to endure onboard the ship. Often all activities can be experienced as totally meaningless and without purpose for a sailor, in that situation.[16] Therefore, the importance of the group can hardly be stressed enough. Likewise, it should by now be quite clear that if the officers fail their responsibilities to monitor and guide at the initial state, it will be extremely difficult to change already established patterns later on. Attitudes are not easy to alter.

It might also be useful to look at some of the traditional attributes commonly used by military leaders as indicators to estimate the combat ability or "military worth" of a group of fighting men. In the text "Naval Leadership"[55] definitions and elaborate discussions of discipline, morale,

loyalty, professionalism (of leaders), and l'esprit de corps can be found. In the following treatment these attributes will be dealt with rather casually. The intention is to explain their meaning in the context and terminology of group psychology which is slightly different from the traditional way of presenting the discussion.

Discipline can be interpreted as the degree to which formal norms are followed by the members of the organization. As long as the norms of the various groups coincide with (or fall within) the region of formal behavior to be observed by every crew member, there is no conflict. The reason why the directions or rules are not broken may be due to positive or negative incentives. If it is done because the regulations are accepted as necessary and useful and are followed whether superiors are present or not, the discipline is positively motivated. If the compliance is based on fear of punishment, the discipline is negative. If the rules are accepted as a norm or value reference for the person guiding his behavior pattern even outside the context of his organization, this person is likely to live up to the standard given by his superiors whatever the consequences. Such an individual has self-discipline. He needs no further guidance or motivation to follow the given norms. In a group where those with self-discipline in the sense explained are the norm builders or natural leaders on the informal level, morale is likely to be high.[16]

The last step in this analysis will be to look at the combined effects of the individual and group efforts, at

the level which is called the organization. The goals justifying the very existence of the frigate will be found on this level. In other words, the total system has to produce a satisfactory output in accordance with the expectations different vested-interest groups (i.e., the Navy and society) have regarding quantity and/or quality of the produced services.

c. Organizational Level

At the organizational level the frigate's performance will be compared with that of other frigates. Based on observed accomplishments a reputation as a fighting unit will be earned. Merits in exercises might be important for pride and self-confidence, but more often than not observers outside the ship itself will use other criteria. From experience it is known that important output factors in this context are:

(1) The CO's ability to maneuver out of and into port, including the elegance with which he handles the ship when securing along a pier.

(2) The speed and precision with which the deck crew ties up the vessel in harbor.

(3) The uniform and orderly appearance of the deck crew when proceeding in and out of harbor. (Different uniforms, loud shouting especially when swear words are used, and inefficient handling of securing lines always make a poor impression.)

(4) The display of correct and firm behavior, proper looks, and smartly kept uniforms will always suggest military

efficiency when exhibited by men on duty in port and tend to create respect and belief in the ship's ability as a fighting unit.

(5) The behavior of crew members in port when on shore leave or otherwise absent from the ship.

The items listed above might not seem to be the most crucial ones in the objective evaluation of the ship's fighting capabilities and that is probably true. But as Admiral F. H. Johannessen, former Norwegian Chief of Defense, pointed out to the midshipmen at the Naval Academy, when he was their director, these factors are important because neither civilians nor those who evaluate the morale and ability of our forces for purposes of possible confrontation have the opportunity to take part in exercises at sea.[29]

Anyway, the reputation of the unit has a profound impact on the morale and l'esprit de corps of the crew. Meaningful, fair competition between units could increase motivation significantly in the areas included. In the Royal Norwegian Navy this potential incentive is only realized to a very little extent outside the area of sports. Games where units compete are being arranged twice a year. One arrangement takes care of summer sports, the second covers winter sport activities. However, assuming specific criteria exist in the form of operational requirements, rewards such as "the Frigate of the Year" could be introduced. And that honor would most certainly provide a meaningful addition to the factors listed above as a basis for reputation as well as being an adequate measure of relevant output factors.

Various symbols of the unit such as patches, pictures on matchboxes and postcards that can be used by individuals to indicate membership have always been a useful tool in maintaining l'esprit de corps. Nowadays, when crew members seldom use the uniform when on leave, the function of these items probably has become even more important. Activities that create results that can be of common pride should be strongly encouraged for similar reasons. An excellent dance band for example can bring fame to the ship especially if its name can be associated with that of the vessel.

The justification of a warship's existence is its contribution to the deterrent against external aggression that a country's armed forces are supposed to accomplish. Since the main purpose is to prevent war, the mission has already been partly failed if war breaks out. But only in that case can combat be experienced and the true quality of the frigate's output be established. Therefore, all peacetime criteria however clever they might be designed are somewhat artificial. But since war is such a dreadful business, all possible efforts should be tried to develop the best possible substitute criteria so that the money and manpower used in this area can contribute optimally to the efforts of keeping peace. In brief, the presence of what in Navy terminology is called a happy (and effective) ship can be indicated or found when sailors:

(1) show self-respect and pride in their groups (division, watch, and unit).

(2) treat their superiors with genuine respect and trust.

(3) accept the authority of officers.

(4) follow the rules and regulations governing their roles as crew members.

(5) rapidly accept, learn, and adjust to the norms of their new shipmates with a minimum amount of conflict.

(6) show initiative to fix malfunctions immediately and suggest volunteer work to improve the appearance of their ship.

(7) besides being good in their jobs, show high-level sparetime activities in areas like sports, bridge, ship's newspaper, ship's band, etc.

Summary

Regarding the frigate, persons placed on different levels in the hierarchy may vary substantially in their need structure. If an efficient unit is going to develop the sociotechnical system has to allow for satisfaction of needs of all personnel categories within the frame of the activities required to be carried out in pursuit of organizational goals. If conflicts arise, the individual goals normally will be given priority. The possibility of negative sanctions from the group members in most cases outweigh the presence of similar threats on the formal level if the latter is not of extreme consequence. Therefore, the development of norms that are in harmony with the activities necessary to achieve required goals is an aim in its own right and can never be guaranteed to happen. But active participation in the group process on the part of the officers could minimize the probability of the development of negative attitudes and norms.

In the maintenance of desirable norms, the establishment of l'esprit de corps should be pursued vigorously. Pride in unit membership is probably the single most valuable tool in keeping up motivation, positive discipline, and morale and hence a very helpful basis for improving performance. Carefully used, friendly competition between groups and units more often than no proves to be of value in maintaining effort and pride.

The presence of operational objectives at the individual, group, and organizational levels is considered to be useful from several point of view and will:

- provide clearer understanding of organizational goals.
- make it easier to communicate meaningfully.
- increase the value of feedback since a standard to measure against is present.
- make it possible for ratings to participate in the planning process because the requirements are known.
- provide a meaningful guide for self-evaluation and the identification of weak areas to be given extra attention and priority for improvement.

2. The Frigate as a Sociotechnical System

The first systematic approach to organization was based on the work of F. Taylor [28, pp. 144-145] and is known under the name scientific management. The principles of this school have been widely used in designing organizations. The man in the system is analyzed and treated like a machine. The most well-known area of application is the assembly line. According to Walker and Guest [54] jobs designed in agreement with the basic

philosophy of this method exhibit the following characteristics:[28, p. 145]

a. Mechanical pacing. (The speed at which the employees work is determined by the speed of the conveyor line.)

b. Repetitiveness.

c. Low skill requirement. (Easy to learn jobs - minimum training costs, maximum flexibility.)

d. Concentration on only a fraction of the product.

e. Limited social interaction.

f. Predetermination of tools and techniques (determined by staff specialists).

The design of many jobs onboard the frigate is based on the principles of scientific management, (e.g., tasks of the gunnery crew). The idea is to produce a maximum number of rounds fired per time unit by maximum use of specialization and simplication allowing efficient drill procedures to be implemented.

The advantage the gunnery officer has, compared to the assembly line foreman, is (1) that the quality and quantity of the output might make the difference between life and death, (2) that the exercises do not have to last for a whole work day, and (3) immediate feedback of performance is given. The gunnery crew also has many other tasks to perform regarding maintenance and general watch-keeping duties.

The important point to observe is, according to Herbst:[25, pp. 3-4] "(that) the technological system determines the characteristics of the social system through the allocation of work roles and the technologically given dependence relations between tasks. Performance is a function of the joint operation

of the social and technical systems. Functional consequences of the social system are not easily modified insofar as the social structure is based on the requirements of the technological system." These ideas are illustrated in Figure 4.

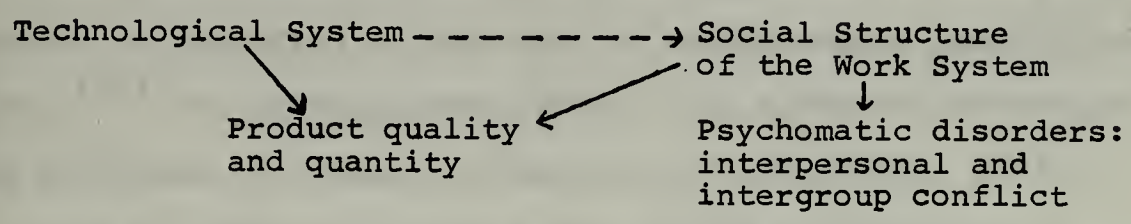

Figure 4. Sociotechnical Interactions [Herbst, 1974, 25, p. 4]

A study that has become almost classical in the field of organizational behavior was conducted at the Hawthorne Plant of the Western Electric Company.[42] A significant discovery was that individuals develop informal norms to protect themselves against the most inhuman demands created by the technology surrounding them.[8] The most important rules found can be summarized as follows[42]:

(1) You should not turn out too much work. If you do you are a ratebuster.

(2) You should not turn out too little work. If you do, you are a chiseler.

(3) You should not tell a supervisor anything that will react to the detriment of an associate. If you do, you are a squealer.

(4) You should not attempt to maintain social distance or act officious. If you are an inspector, for example, you should not act like one. ("You should be one of us.")[1]

The interpretation that the main function of norms are protective is supported by the work of the Norwegian sociologist Lysgaard.[35] He distinguishes between the technical-economical system which has its values connected with efficiency, profit, etc. It is the basic or planned part of the organization on which the informal social system is based. Lysgaard calls this the human system. The technical economical system offers something to the members, but it is also demanding. Many times the requirements appear unlimited, unresponsive (to human needs), and overwhelming. Apart from the primary group membership Lysgaard also identifies a broader system that includes all subordinates or workers. Some are members without knowing it, others are against their will. He calls it the collective of workers.

Lysgaard lists the following conditions are necessary for the development of a collective:[35, p. 91]

(1) A formal, planned organization guided by efficiency and profit, i.e., a technical-economical system.

(2) An employment contract.

(3) Individuals can refuse personal relationship to

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[1]Freely after Roethlisberger and Dickson.

the technical-economical system and regulate their attachment towards it through the collective.

According to Lysgaard there are three main forms of membership:[35, p. 89]

(1) The active, norm setting or interpreting ones.

(2) The passive accepting ones.

(3) The active opposing ones (who are members through their position in the technical-economical system, but do not recognize the collective and its norms).

One may ask what all this had to do with the frigate. The main point is to show that if the officers do not respond to the needs of the ratings, a common social system may develop among them to protect their human integrity. Lysgaard's conclusions are clearly in agreement with those of Herbst.[25] To establish an effective unit, the sociotechnical system has to satisfy organizational goals and human needs at the same time. Onboard a vessel this is even more important due to the special conditions existing. Sailors have to live onboard their ship 24 hours a day, not just for the duration of the workday. This adds extra stress on the individual and increases the improtance of awareness towards the satisfaction of human needs. The sailors also have many common characteristics (conscription, status, uniform, age, working conditions, etc.), and they share many problems (difficulty adjusting to the warship environment, responsiblity for own washing and cleaning, crowded living quarters, lack of privacy, few alternative sparetime activities, modest cash allowance, etc.).

However, there is a significant difference. While factory workers often have similar backgrounds and basic values, the subscripted sailors are recruited from all shades of life.[39] They represent many different social, economical, occupational, and educational groups. Quite a few have already held positions of leadership, others have been educated to become future leaders. Even though such persons by status are common crew members, it is the experience of the author that their values are usually closer to those of the officers. Therefore, as long as insight and experience are applied in combination with awareness and common sense, the development of a workable social system within the given technology should be possible. Those with leadership experience or aspiration will more often than not belong to those who are active, norm setting or interpreting. By treating those key persons (who may relatively easily be identified by observation if the officers taken an active part in the program of their groups) as mature, responsible individuals and by delegating authority to them, they might prove very valuable in the development of efficient groups. This is not to say that they are the agents of the officers in a manipulative sense (one possible viewpoint of course), but rather a communication link. They know the agonies and reactions of the group members which they can explain to their division heads. They can also often help the officers by interpreting to group members the purpose and intentions of actions taken by their superiors. This is a direct contribution to the development of a workable socio-technical system where conflict of interest can be solved constructively.

Next, let us consider a general input-output model. An open system model can be viewed as visualized in Figure 5.[5, p. 22]

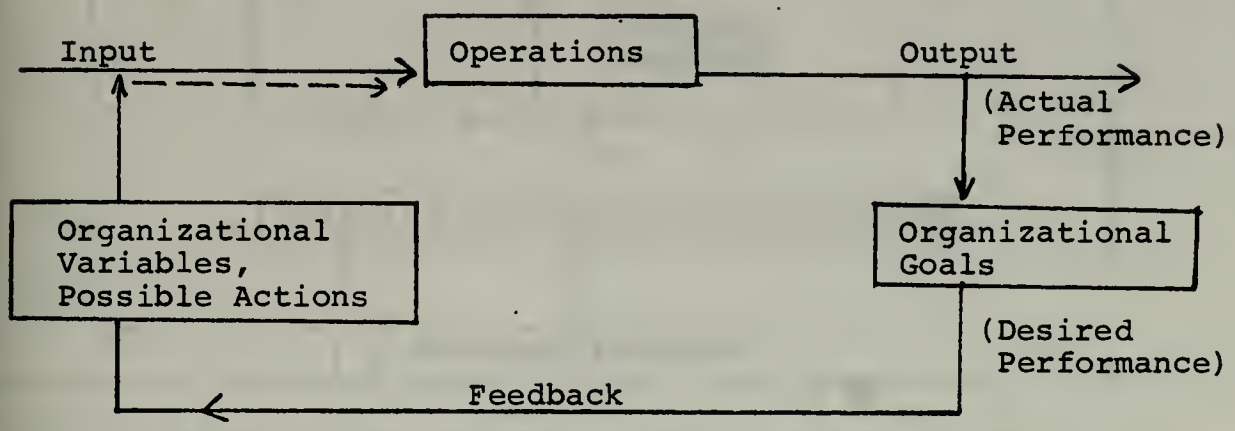

Figure 5. General Model of Open System. From Blegen and Nylen[5, p. 22]

Ivancevich and others[28, p. 315] suggest the same basic slightly extended model. According to them an organization involves a number of activities (See Figure 6):

(1) Receiving inputs.

(2) Transforming the inputs - controlling, coordinating, and maintaining the necessary activities to produce results,

(3) Generating outputs.

a. Input Factors

Inputs are the human and technical resources made available to the frigate as a basis for the CO to accomplish his mission. Included is the ship itself with its standard equipment of weapons and other systems. Technical parameters such as engine power;

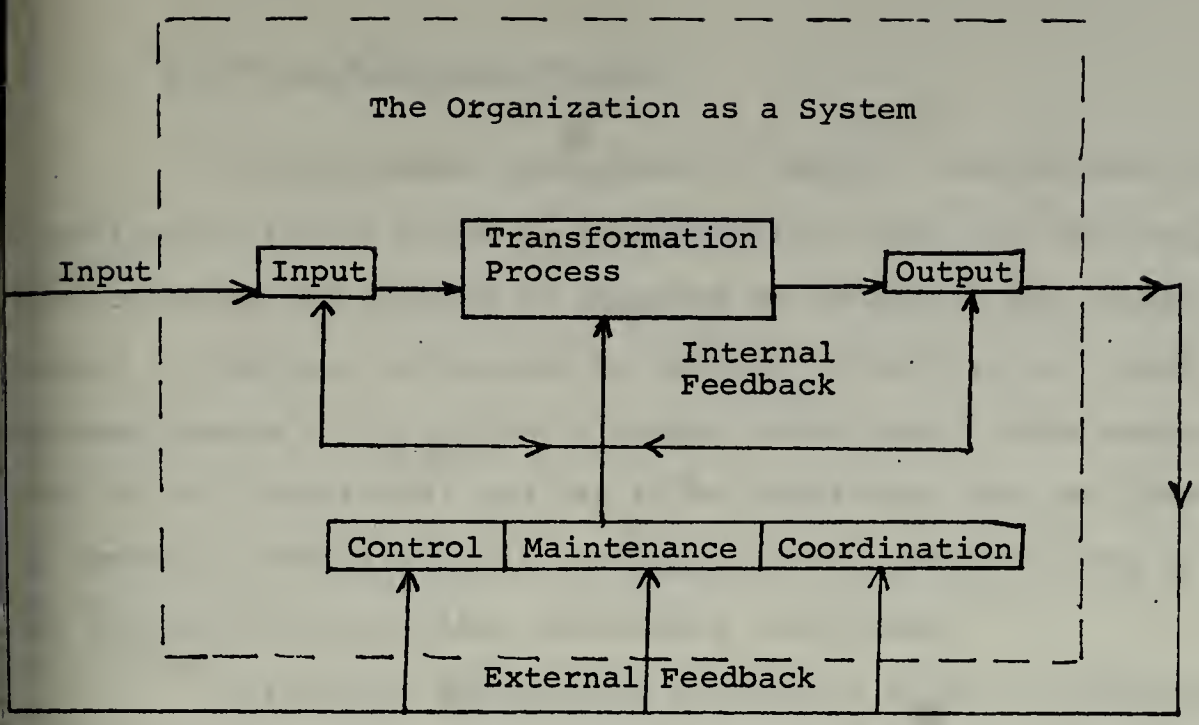

Figure 6. A Basic Systems Model. From Ivancevich, Szilogyi, and Wallace[28, p. 315]

type, number, and sophistication of weapons systems; etc., constitute basic limitations and possibilities. The same applies to the human element. Crew members, officers as well as men, are assigned to serve, and their knowledge of how to do things, their professional skills, educational level, and motivation vary considerably. Therefore, it is somewhat arbitrary and for the most part outside the powers of the CO to influence the quality of the inputs. However, quantitatively he may ensure that he is given the correct number of crew members of each category as well as the systems and inventory he is entitled to receive in agreement with the ship's manning and equipment plan.

b. Transformation Process

Applying the subsystems of control, maintenance, and coordination the CO tries to transform the input into the output factors which the frigate is supposed to produce. The overall output is fighting efficiency or ability to survive and cause maximum damage to opponents in combat situations. This stated goal is not operational and has to be quantified and qualified by specific objectives that can supply meaningful guidance on the levels where practical activities take place.

Since the operational objectives apply on subsystem level, coordination of activities is a crucial factor to prevent suboptimalization in the pursuit of organizational goals. The structure required to integrate all effort efficiently in combat readiness situations creates the need for strict, formal procedures. Hence, the coordination subsystem plays an extremely important role in combining all resources optimally towards fulfilling the frigate's goal.

However, it is of equal importance to make sure that the different functional subsystems (departments and divisions) emphasize the correct areas in planning, training, and the maintenance of equipment. The control subsystem is used to monitor all activities to see if progress is made to meet set standards. Effective control requires that relevant criteria exist against which to measure individual, group and organizational performance in the operation and maintenance of systems. Control yields the information and feedback necessary to evaluate, review, and change programs. Moreover, control also requires

the checking of inputs. For example, improvement or deterioration in basic professional training of officers or men may be detected and reported back to institutions responsible for such programs.

It should be emphasized that efficient control depends upon the availability of operational objectives and goal clarity. If no required standards are specified, feedback can only be general and of limited value. Furthermore, generalities provide poor guidance with regard to which areas should be given higher priorities in adjusting training and maintenance programs.

No formal organizational structure, however well it may be designed, gives any guarantee that the human members of the organization will behave in accordance with the norms and required duties of their roles. Onboard a man-of-war it might mean the difference between life and death if anybody does not know his job and makes a serious mistake in combat. The same applies to negligence of duties and sloppiness in keeping equipment running properly. Therefore, a primary objective for any CO is to explain this fact to his officers and men alike and try to make them understand and accept the challenges and responsibilities implied. If he succeeds in doing this, a major accomplishment has been reached. However, in order to keep the crew members motivated for continued efforts, a maintenance system is needed consisting of subsystems for socializing, rewarding, and sanctioning. In order to fulfill the organizational goals, certain rules of behavior are required to regulate interrelations among individuals and between groups. These norms

are often quite different from those the conscripted sailors have experienced in the society outside the military. Therefore, the process of establishing acceptance for the rules guiding life onboard a man-of-war might both be difficult for those in charge as well as painful for the individuals who are required to adjust and comply. Socialization is a slow process, and positive reinforcement and patient explanation usually works better in the long run than extensive use of harsh punishment. However, the military system demands obedience, so discipline is a necessity. Hence, sanctions must be used against willful wrongdoings and in cases of gross neglect of duties. On the other hand, excellence in performance or effort should as often as possible be rewarded. A word of recognition is many times enough to reinforce improvements.[23, 30]

It should be pointed out that in the context of a warship where teamwork is of such importance, rewards should as often as possible be given to a whole group. Individual rewards might create jealousy, conflict and unsound competition between team members while group rewards tend to strengthen proudness of group membership and improve relations between individual members. The norm should be cooperation and participation within groups and friendly competition between groups. This does not mean that outstanding individual achievements should be overlooked but that emphasis ought to be on group development. However, punishment should always be given to the individual involved, never to the group. Attention should be paid to the old rule of thumb: praise in public, reprimand in private.[55]

c. Output Factors

The military is a nonprofit organization. The benefits produced by our frigate are extrinsic and the general public is the prime beneficiary. The frigate is owned by the public, and its expected services are combat potential and readiness.[28]

d. External Environment

When an organization is viewed as an open system, the interactions it has with the surrounding environment must be considered.[28] External forces may be regarded to be supersystems to the organization. The dependence is shown in principle in Figure 7.[28]

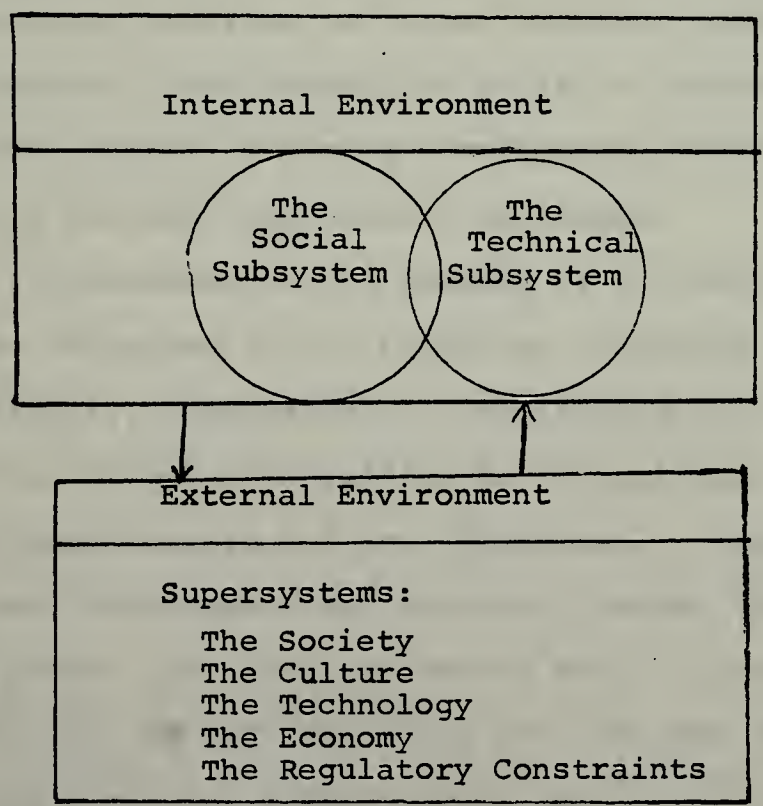

Figure 7. General Open System Organization in Interaction with External Environment. Freely after Belgen and Nylen.[8, p. 32]

The societal environmental factors listed as supersystems in Figure 7 most certainly play a role in the input-transformation-output process of our frigate.

All military organizations will heavily rely upon the general attitude of the public in matters concerning defense. This is especially true in a democratic country depending on universal conscription and mobilization forces. Changes in political climate and cultural factors will directly influence the day to day activities in the armed forces as pointed out in the background discussion in Section I.

Technical advances will start the introduction of new systems and weapons which in turn obviously will require different training programs and cause tactical procedures to be altered. Likewise, improvements in logistic support will often facilitate the efforts of keeing complicated systems working and hence help increase the overall readiness.

Fluctuations in the economy of a country will in most cases be reflected in the resources allocated to the military. Finally, administrative regulations will in peacetime tend to grow in amount and rigidity as the military establishment becomes more bureaucratic and less functional. Limitations imposed by such development can seriously hamper the efficiency of military units. The Royal Norwegian Navy in particular has been severely hurt by workhour rules for officers and the introduction of the so-called environmental act.[1, 32] The overtime pay and inconvenience benefits cost so much that only sailings of relatively high operational priority can be justified

outside the agreed workhours in addition to planned participation in major, scheduled exercises. Besides the fact that many officers find the increased time spent in harbor, especially when far from their homeport, of doubtful value, the decrease in the sailing program most certainly requires improved planning to prevent a decline in combat readiness.

Summary

In this section we have discussed the frigate as a socio-technical system. We have seen that the social subsystem is heavily dependent on the technical subsystems. The overall situation of the sailors on our frigate was compared to that of workers in a company. The examination revealed similarities but also significant differences. We found that care has to be taken so that conditions causing a sailors' collective to emerge are not met. Such developments would be counterproductive since human needs might tend to be seen apart from the organizational goals. Such separation would necessarily increase the level of conflict between officers and ratings and much cleverness would be spend in vain, each group trying to come out of confrontations as the winner instead of working together.

Next, the general input-transformation-output model was presented and examined in the context of the frigate. The transformation subsystems of control, maintenance, and coordination were also considered. Finally, important external factors influencing the organization's internal systems, functions, and processes were identified and discussed. We found that the

surrounding environment plays a significant role in the process of determining internal activities and priorities.

C. ORGANIZATIONAL VARIABLES AND PROCESSES

The discussions so far have included:

(1) an examination of the background factors, and

(2) two different ways of describing the frigate

(a) an organizational level approach

(b) an input-output model

In this section some of the most important aspects regarding organizational variables will be presented and discussed in the context of the frigate.

1. Structural Levels

Every organization has some kind of structure. Blegen and Nylen[8] explain structure as "relatively stable patterns that exist over time in a system." March and Simon[36, p. 170] have suggested the following definition: "Organization structure consists of those aspects of the pattern of behavior in organizations that are relatively stable and that change only slowly."

However, the degree of structure in different situations has some important implications. Regarding the frigate, the "action station" situation is extremely structured. If, for example, the ship is under attack by aircraft, the desired output is to shoot down the planes before any damage has been sustained. In the absence of a formal procedure this mission is virtually impossible due to the time element involved. A successful outcome also would depend heavily upon proficiency of drill independent of the potential of the weapons. The

process can be viewed as an assembly-line with required sequential tasks consisting of detection, reporting, selection of targets and weapons, weapons direction and control, opening of fire, and ceasing of fire. Similar procedural chains have been drilled for other systems as well. Another example is the sonar (detects) and antisubmarine weapons (destroy the submarine) combination. Likewise, when the Officer of the Watch is navigating the ship, his orders to the helmsman are always exact, and strict procedures for repeating orders and reporting back when executed are always observed.

The necessity of structure in the examples given above should be easy to understand and accept for most people. As mentioned, the time factor is so crucial that if not every order is correctly understood and promptly responded to, a disaster could result. Either the frigate might be sunk, or the ship could be grounded or run into another vessel. It is also required that it is absolutely clear who has the authority and responsibility to make decisions and issue orders.

However, even on a man of war, there are aspects of systems and processes that do not functionally require the same rigid structure. An example case would be the deck crew when securing the ship along a pier. Certainly, the possibilities for individual judgment and action are still small, but if surprises occur individual, rapid reactions might be praised (if they are the right ones).

How does all this fit in with the participation directive given by the Chief of Defense.[12] In general, it most certainly

shows that there are numerous areas where this program cannot be applied. This conclusion has considerable support from research comparing the technical system and the organizational structure.

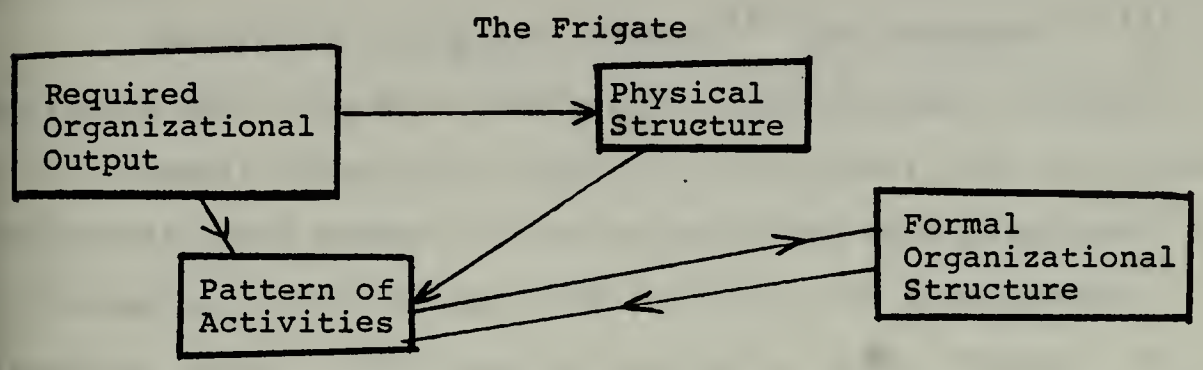

Figure 8. Organizational Structure of the Frigate. Freely after Blegen and Nylen.[8, p. 48]

Figure 8 illustrates that the output required in certain situations, as exemplified above by the action station and confined water navigation cases, dictates the necessary activities. The objectives are implicit (e.g., survival) and as long as the technical system (e.g., physical structure) is given, the procedures (e.g., pattern of activities) are more or less fixed. There is always room for minor refinements (e.g., minor changes in formal organizational structure and as a consequence, the pattern of activities), but as long as the physical structure remains the same, the basic constraints stay unchanged.

It is important to realize and explicitly point out that the externally given performance standards in the areas concerning combat readiness can only be changed by the responsible authority. Minor deviations from approved procedures should,

of course, be allowed to be internally implemented at the discretion of the CO. However, such improvements should be promptly reported in order for others to benefit if the proposals are accepted as a procedure innovation by the proper authority.

Research by Burns and Stalker[11] and Woodward[57,57] indicates that organic or democratic organizational structure (i.e., loosely structured pattern of activities) tend to create discontent among members of the organization when introduced in situations where the physical structure and given output standards leave little room for meaningful major changes. In short, when the product is determined and the assembly-line built, there is not much left to discuss and/or alter. Hence, people tend to be more content under such circumstances when explicit rules and requirementsare given. Therefore, the studies referred to suggest that a mechanical or autocratic organizational structure in such cases is more or less implied by the technological system. Hence, the drill procedures used on the frigate in the situations described should not only be effective from a time constraint output point of view, but also from a consideration of crew satisfaction presuming the research findings are relevant.

Hence, possibilities for fruitful participation has to be found in areas outside these very structured ones. So far, the frigate has been described by two main subsystems, the social and the technical. If the technical system is divided into two parts, the first subsystem will consist of activities

which imply rigid or mechanical organizational structure, while the second, even though subject to certain limitations due to physical structure, can allow for more organizational flexibility. An attempt to show this idea is made in Figure 9.

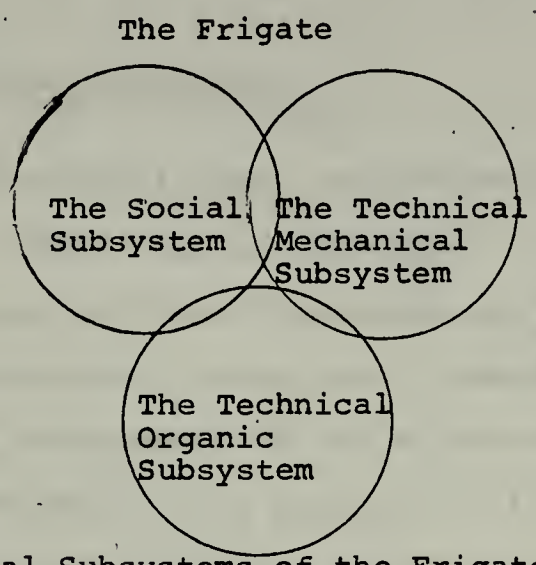

Figure 9. Internal Subsystems of the Frigate. Freely after Blegen and Nylen[8, p, 31]

It can be seen that both of the technical subsystems interact with the social subsystem and with each other. In the participation directive,[12] the following areas are recommended as suitable for the realization of the program.

(a) Training and education programs.

(b) Discipline, social customs.

(c) Quarter regulations, requirements, and inspection.

(d) Sparetime activities (including sports).

(e) Aspects of regulations for leave of absence.

(f) Other areas of welfare.

The listing is by no means exhaustive, but provides good initial guidance about which areas to choose from when trying to develop meaningful participation schemes. The examination of the two technical subsystems brings up the question of the goalsetting process which will be investigated in the next section.

2. The Goal-Setting Process

It seems reasonable that the goal-setting process for the two technical subsystems is different. In the case of the technical-mechanical subsystem the goals are externally given in the form of operational objectives. However, their form is more or less a consequence of the situation (physical structure, time constraint) as pointed out in the preceding section. The process of revising goals and evaluating performance against this standard is shown in Figure 10. The model is based upon the works of Bloom[9] and Krathwohl.[33]

The model illustrates the usefulness of operation objectives that has been claimed on several occasions in preceding discussions. Providing the exact performance criteria and structural frame for the mechanical part of the subsystems, the model makes an important contribution to the organic subsystems as well. Arguments for the first area have already been presented, so the discussion will focus on the second aspect.

Confronted with explicit objectives for the first time, many people react as if their very existence constitutes a constraint. However, objectives supply goal clarity or, in other words, the directionin which to move, but prescribe no path to follow to get there. The old saying, "There are many roads

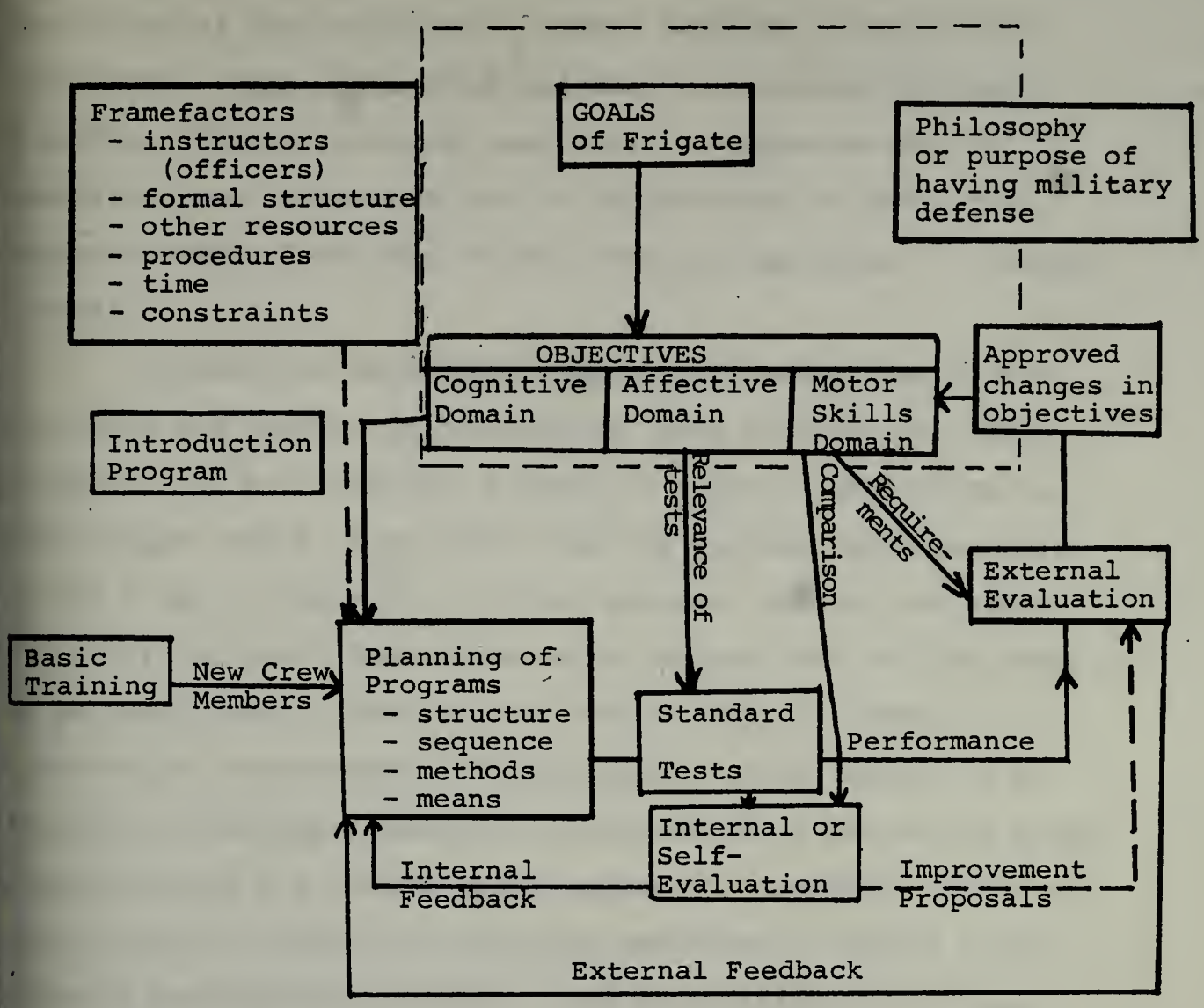

Figure 10. The Goal-Setting Process for the Technical-Subsystem. Freely after lecture notes by L. S. Wilhelmsen, University of Bergen, Norway.

that go to Rome." has full validity in this case. It is up to the responsible officer to search for the best road. He should make the best use of all available resources including the active participation of his ratings. In this sense the model is a part of the technical-mechanical subsystem as well as the technical-organic subsystem. Regarding the latter, the department or division officer should, of course, let the sailors have their

own copies of the objectives. During debriefs everybody will then have a common reference, and they can meaningfully make statements about strong and weak areas. Weaknesses can be identified and the ratings get the opportunity to share the responsibility of deciding which areas need priority in training efforts.

In addition to adding valuable information due to the knowledge and insight of the ratings, such debriefs will help implement the participation program in a very constructive way. Furthermore, there is no doubt that the sailors will appreciate having a say in their own training program. Hence, the probability of increased motivation on the part of the ratings ought to be significant. External evaluation, say, by teams of inspectors as recommended in the discussion of the models of the frigate, would supply additional information to the within group considerations and provide extra guidance. Hopefully, such outside input will result in even more eagerness by adding incentives to participation efforts. The more balanced, detailed, concrete, and constructive the evaluation is, the better the expected reinforcement of external feedback.

Most other items listed in the participation directive, can be considered a part of the technical-organic subsystem in interaction with social subsystem and the external supersystems (see the models of the frigate). The goals might not be explicitly stated for quite a few activities in these areas, and the basic values of the participants in the process might play a more important role as input than specific feedback. In many cases the process itself will generate results that in fact are equivalent

to creating new (or explicit) goals. This process can finally be modeled as a coalition of different groups of people trying to hedge their interests by influencing the content of programs and priority of associated activities subject to external and internal constraints.

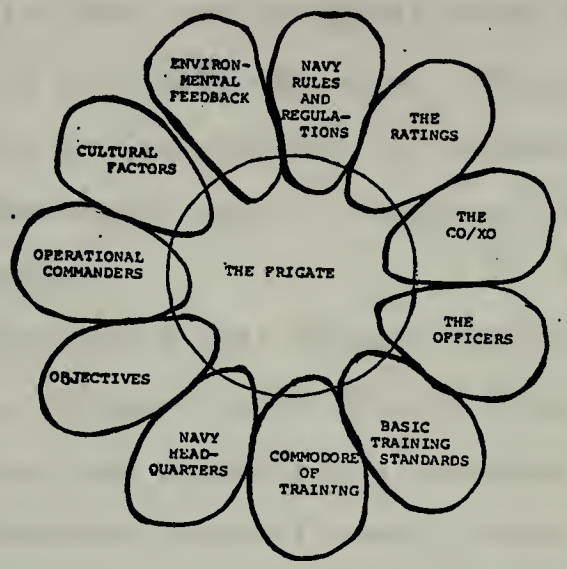

Figure 11. The Coalition Model (illustration) from Blegen and Nylen[8, p. 162] after Rhenman.[41]

According to Rhenman,[41] the coalition is a mechanism for balancing of conflict of interest and the establishment of cooperation among the participating partners.[8, p. 163] The participants have to agree upon a common goal that can prove beneficial to everybody as shown in Figure 11. Hence, a common denominator has to be found that will guarantee a minimum gain to all of those who contribute. If the balancing is unsuccessful, some will find it more advantageous to their cause to

withdraw and maybe oppose the efforts of others to fulfill the purpose of the organization (in this case the frigate).

In the organizational literature, the method of applying measurable objectives is known as management by objectives (MBO). It cannot be seen that the integration of the principles of MBO methods [24, pp. 423-424] and those of the educational goal model presented in this section should cause any major difficulty. The approaches are basically the same. They are only presented in slightly different phrases because the schools of thoughts within which they were developed vary in language traditions and the areas of application.

It has been mentioned that specific objectives may be a helpful device in reducing noise between people placed at different levels in the organization, especially with regard to perception and interpretation of goals. That brings up the domain of communication theory which will be discussed next.

3. The Communication Process

Communications patterns are an integrated and important part of the organization. Means and ways that are established to communicate often create structures more crucial to the soundness of the organization than any other aspect. Again a rather narrow presentation has to suffice. The main objective will be to make the point that in the theory of communication the question of "how" is just as important as "what." In other words, the choice of media and channel is not trivial even though the content of the message sent is the same in an objective

sense. In human communication noise arises from differences in values, cultural backgrounds, and perceptive expectations plus quite a few other sources. For example, members of one group are often found to be pray to stereotypes regarding members of other collections of people. All such factors influence the interpretation of the message. In brief, it can be said that humans communicate on two levels: (1) the subject level (an analysis of the objective content of the message as phrased) and (2) the emotional level (the additional information received through gestures, emotions, values, etc., detected by the receiver). However, the latter might just as well be partly caused by the receiver's own perceptual bias. Blegen and Nylen have an excellent presentation of the Theory of Communication.[8] For those who do not read Norwegian, the text by Owen, Page, and Zimmerman is recommended for an overview.[38] When the CO addresses the whole crew at one time, say, over the intercom system, the communication is said to be one-way. In a group the communication is two-way. If a receiver does not fully understand the message, he may ask for further information or additional explanation. Hence, it should be clear that the ability to listen is just as important an element in the process, as the ability to speak.

In the following a few examples will be presented. Let the first one be general. In a group of five persons there are four men and one woman. Each time the woman speaks, one of the male members at once starts talking to the two persons sitting closest to him. Hence, only one of the four male members of

the group listens to the arguments of the female. If the group has to work together for a while it seems quite likely that the woman will develop negative feelings towards the three who always establish a subgroup when she has something to say. She should not be blamed, since their behavior clearly communicates a strong message about their regards for women. Hence, their values towards females have been revealed even though not a negative word indicating such attitudes have been uttered.

The CO and his officers should watch out for similar attitudes towards their sailors. People who regard themselves as superior human beings compared with others will often reveal their real values indirectly just as it happened in the example. Furthermore, civilian stereotypes of career military (cartoons, etc.) often suggest such attitudes in the value orientation of officers. Hence, the negative and hypercritical elements of the crew will very likely keep a close watch to discover proofs of such behavior. Therefore, any officer should try his best to learn to know his men individually. (Their names, occupation, interests, where they live, marital status, etc.) Then it will become quite natural to treat them as unique persons with varying needs and not impersonally as an item on a list of sailors which may be identified by numbers. Arrogant behavior on the part of officers and feelings of superiority do not demonstrate the human attributes that are required to command sailors in war according to Kirst.[1] He seems to mean that only

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[1]H. H. Kirst, "The Night of the Generals," a novel[31]

those who respect their subordinates as equally valuable humans, are fit for such a task. Leaders of that kind of breed will provide comfort and inspiration because the sailors will receive the message of compassion and care in addition to bare orders.

It would be of interest to give examples of a few different schemes COs might use to communicate. Consider a CO who has minimum interaction with his officers. Once a week he orders a line-up of the entire crew. At those occasions he often informs at length about subjects that are quite new to the crew including the officers. Most of the time he deals with his officers through the XO, but not infrequently he calls in a department head--always one at a time. Besides, he keeps all but routine correspondence in his own file. The officers are shown only such letters to which they are specifically assigned to draft an answer. What are the likely effects to be experienced if this scheme is implemented? First, the CO has to rely on the XO for internal feedback since he has so few other sources due to his self-imposed distance keeping. If he is given the extra attributes that he gets very upset when he hears bad news, a classical situation emerges. The XO censors the information he feeds back to the Captain because he is afraid of his reaction or because he likes to please the CO for other reasons. Shortly the Captain will become disinformed or only have partial information available to base his decisions on. Hence, the consequences of what he decides might be grim in many cases. Second, there are always motor noises and other

disturbances present on a ship. Hence, more often than not, many of those who listen will not hear clearly everything that the Captain says. Besides, some sailors may not always comprehend what was said. In both cases they will go to their division officer and ask for further explanation. Then they will discover that he does not know any more than they do. After a few such experiences they will not ask any more. It should not be hard to understand what influence that will have on the authority of junior officers and the morale of officers and crew. Not only will lack of information make the officers look stupid in the eyes of their subordinates, but since the CO always talks only to one at a time, suspicion and envy may arise among them as well (who does he listen to?).

An independent and loyal XO may minimize the effects outlined above by being frank with the CO in his feedback and by keeping the officers informed as best he can. It would be of special importance that he makes it a rule to address them as a group. Then each officer can be judged by the others on the merit of his contributions, and accusations of favorite picking can be prevented. However, in some cases the XO may virtually be bypassed and the CO will choose one of the department heads as his main advisor. In such situations even those most loyal to the system will as XO have a hard time to keep the officers together as a team and to succeed in maintaining efficiency.

Another CO implements an almost opposite information scheme. Before he gives any major address to the crew he briefs

his officers thoroughly on the subjects and gives them ample opportunity to ask questions. Hence, when a sailor comes to his division officer, he will get straight answers. As a consequence his regards for thrust and confidence in his superiors will increase. Furthermore, this CO has a weekly meeting with all his officers. An agenda is worked out in advance based on proposals from himself, the XO, and the officers. The XO is the coordinator. There is also a possibility to bring up other subjects at the end of the meeting when all formally listed items have been discussed. The CO also requires his XO to schedule daily formal briefs with all officers not on duty present in order to coordinate policies and provide feedback. The XO on his part demands that the division officers in turn meet at regularly scheduled times, at least once a week, to debrief his division on general matters and to give feedback on training progress. Quite often the CO will listen in on the officers' brief himself and the department heads usually will participate in the division meetings.

Likewise the Officer of the Watch (OOW) will formally summon his officers and men to discuss progress and plan training activities. On his weekly address the CO will always comment on which of the three watches has performed best or made most improvements that week.

Last, but not least, the supply officer who is the ship's postmaster and the secretary of the Captain, has been ordered to supply a daily list of incoming and outgoing mail. Correspondence

that the CO or the XO think should be brought to the general attention of all officers are put in a folder together with the list. The Captain even requires the officers to initial the list to indicate that they have read todays folder.

It should be fairly safe to predict that this information scheme will contribute to improved teamwork among officers and to increase the authority of younger officers.

Next a classical example of communication fallacy will be presented. The OOW will have 2-3 junior officers of petty-officers to assist him in his duties in harbor. They will divide a 24 hour watch into on-duty and stand-by hours. The one on duty will mostly stay on deck to supervise the ratings on guard or he will be on inspection tours. Quite often some of the ratings presently not on post will ask permission to run for one hour, go to the post office, etc. Due to fire protection plans and other reasons there is a minimum requirement on manpower to be on standby duty. Hence, sometimes the assistant OOW will say no to such requests. Not uncommonly the rating will then see the OOW and ask him. Unfortunately, sometimes the OOW will grant permission without consulting or informing his assistant. If this happens and the assistant does not bring the problem to the attention of the OOW, then there is a high probability that the procedure may be repeated. And before long the assistant's authority will fade, and he will start neglecting his duties. Furthermore, if the same thing happens to other assistants, the whole group of junior officers or petty officers will become frustrated and demoralized.

These are only two workable schemes in this case to prevent such incidents from happening, that is:

(1) The OOW should never allow anybody to see him except when it is arranged through the assistant on duty.

(2) The OOW meets the sailor and lets him present his problem but tells him that he will be informed about the decision via the assistant. Then he calls in his deputy and asks his opinion, resolves the problem, and lets the assistant take care of letting the sailor know.

At the very least the OOW should always keep the assistant informed when he makes such approvals.

Very little has been said about communication theory in this section. Instead, the intention has been to illustrate some possible communication fallacies in the environment of the frigate. Hopefully, the examples also indicate the potential and importance of the establishment of adequate information channels. It should also be quite obvious that proper communication schemes are a very crucial part of the success of leadership and organizational effectiveness.

The examples given are mainly based upon the experiences of the author supplemented with ideas from the text by Captain Helle.[23]

Somewhat related to the goal-setting and information processes, are the process of decision making. A brief, rather schematical presentation of this subject will be given in the next section.

4. The Process of Decision Making

The reader may recall that Vroom-Yetton in their model listed three important considerations with regard to decision making:[12]

(a) Technical Soundness

(b) Acceptance by Subordinates

(c) Time Available

Blegen and Nylen[8] describe the process of decision making as an iterative search and selection scheme consisting of five phases:

(1) Search for Problems

(2) Search for Alternatives

(3) Search for Consequences

(4) Comparison of Alternatives

(5) Decision by Choosing One Alternative

They summarized their views of the process in a model presented in Figure 12.

The process of decision making is closely related to goals, communication patterns, leadership styles and the structure of the situation in which the decision is required. First of all the problem which has been identified has to be recognized as such by the decision maker. Next the time factor has to be considered. In many structured situation as described under that heading, there is no time to collect further information. The information available has to be evaluated, combined with experience factors and a decision made. It is then to hope that the soundness

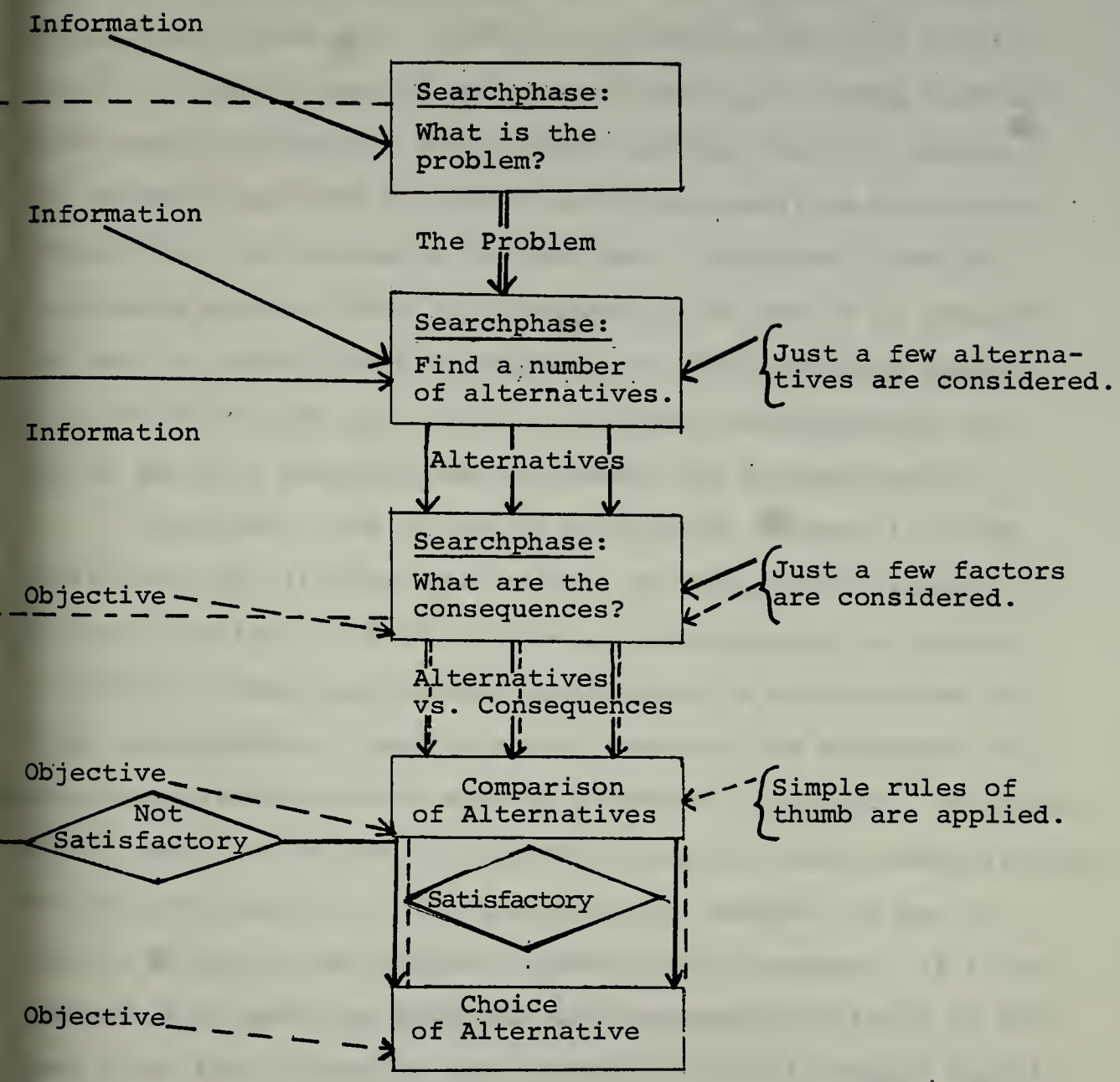

Figure 12. The Process of Decision Making. After Blegen and Nylen.[8, p. 120]

criteria will be met. The acceptance consideration plays a relatively minor role in the technical-mechanical subsystem due to the implied constraints, but is of the greatest importance in decision making in the technical-organic subsystem. When

the time factor is not significant, the communication process becomes more important. If the CO is the one who will finally decide, it can be seen from the model that it is quite important with whom he consults. The officers and the Board of Advisors for example, may have different opinions as well as objectives attached to the problem to be resolved. Therefore, from an acceptance point of view it is essential for the CO to identify the motives underlying the proposals of those who give advice. If he fails to take such input into proper consideration, he may be in for a surprise when he orders the implementation.

Basically, the CO has to distinguish between (1) time constraint and (2) other decisions. For the latter category he should collect as much information as necessary to generate an adequate comparison between representative alternatives and their consequences. Last he should consider the soundness and acceptance factors paying special attention to possible conflicts of interest. If he can find alternatives that meet these criteria and the requirements of the objective, he chooses the one he regards as having the highest probability of success. If it is impossible to meet the soundness and acceptance criteria at the same time, the outcome of the implementation will depend heavily upon his ability to "sell" his "sound" decision. That brings up the question of motivation which is to be investigated next.

5. Motivation

In this section a review of some of the most important theories of motivation will be given. The discussion is mainly

based on the presentation found in reference [10] and supplemented by [21].

The non-volunteer conscription system has the negative aspect that military service is an inescapable duty (as well as the right) of any male citizen fulfilling the physical and psychological minimum requirements. Motivation theories, therefore, are of interest to any commanding officer.

Of special prominence among the theories used to explain motivation in organizations, is Maslow's hierarchical classification of needs. He postulates the following five categories:[24, p. 252]

(1) physiological (food, air, shelter).

(2) safety (security, stability and absence from pain, threat or illness, etc.).

(3) belongingness (acceptance, friendship, affection, love, and so on).

(4) esteem (feelings of achievement or self-worth, and recognition or respect from others).

(5) self-actualization (becoming what one is capable of becoming, that is, self-fulfillment or the realization of one's potential).

These are four basic assumptions to be considered in connection with the hierarchy:[24, p. 252]

(1) A satisfied need is not a motivator (another need always emerges to take its place).

(2) The need network for most people is very complex (several at work at any one time).

(3) Lower-level needs must be satisfied, in general, before higher-level needs are activated sufficiently to drive behavior.

(4) There are many more ways to satisfy higher-level needs than for lower level. (Note: Higher needs are individually determined, i.e., culturally developed.)

It seems reasonable to suggest that an average subscripted sailor who arrives onboard the frigate will first of all seek the satisfaction of safety needs. Hence, he would like to learn what is expected of him. He has to acquire job skills as well as adjusting to the required pattern of accepted behavior in the social system. In the absence of a proper introduction program, he has to obtain the necessary knowledge by asking, observing, and through feedback given to him. If not explained the basic rules and norms, he will probably experience a chain of negative feedback in the form of minor social sanctions. Therefore, from a motivational point of view it is very inefficient not to take good care of those who arrive and introduce them properly.

As soon as the sailor feels reasonably secure, he will probably strive for satisfaction of his belongingness and esteem needs. It was pointed out when the system levels model was presented, that the status of membership group and the presence of l'esprit de corps are important factors in this connection. If the membership in own group is so desirable that the group

is also the reference group[1] for the individual, then the possibilities of satisfaction of belongingness and esteem needs of the members should be excellent. This presumption again focuses on the extreme importance of the group as a key to need satisfaction and basis for organizational effectiveness.

The participation program is intended to assist the CO in finding areas where the sailors may have an opportunity to realize the self-actualization level.[3]

Considering the trivialities of many duties that have to be carried out on the ship and remembering the high average educational level and professional training of the conscripted crew members, it is not realistic to believe that it is possible for everybody to attain that kind of need satisfaction. However, the internal study referred to under the discussion of background factors showed that ability to adjust and find satisfaction in the services increased significantly with level of education. Hence, maybe the prospects for the participation program are not undesirable.

Another approach to motivation has been developed by Herzberg.[24] This theory is quite controversial. The claim is that some job factors lead to satisfaction (motivator factors) while others can only prevent dissatisfaction (hygiene factors). The most prominent motivator factors are achievement, recognition, work itself, responsibility, and advancement. The hygiene factors

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[1]The group he identifies with for guidance regarding his basic values and norms.

include company policy and administration, supervision, salary, interpersonal relations, and working conditions. For the leaders of the frigate this theory indicates that efficient administrative and fair treatment of subordinates in accordance with regulations[49, 121, 122] only provides a foundation for effectiveness. Attention always should be placed on the motivator factors whenever training programs are outlined and exercises planned.

Vroom's expectancy theory attempts to explain how behavior is directed in order to reach a goal. The model is based on four assumptions:[24, p. 267]

(1) Individuals have preferences for various outcomes that are potentially available.

(2) Individuals have expectancies about the likelihood that an action on their part will lead to intended behavior.

(3) People have certain instrumentalities (subjective probabilities) about the likelihood that certain behaviors will lead to the attainment of desirable outcomes.

(4) In any situation, the action a person chooses to take is determined by the expectancies and the preferences that person has at that time.

The CO should make sure that goals known to be highly desirable to many sailors in certain situations are most easily obtained by working for the organization. Unfortunately, rewards like extra time-off for well-done jobs are more difficult to administer and apply than it used to be. The reason for this is that the area of spare time, vacation, and paid trips home have become so regulated that it is hard to justify more time off.

Hence, it has not the same value as a motivator any longer. In Figure 13 an attempt has been made to present the different theories of motivation as an integrated model.

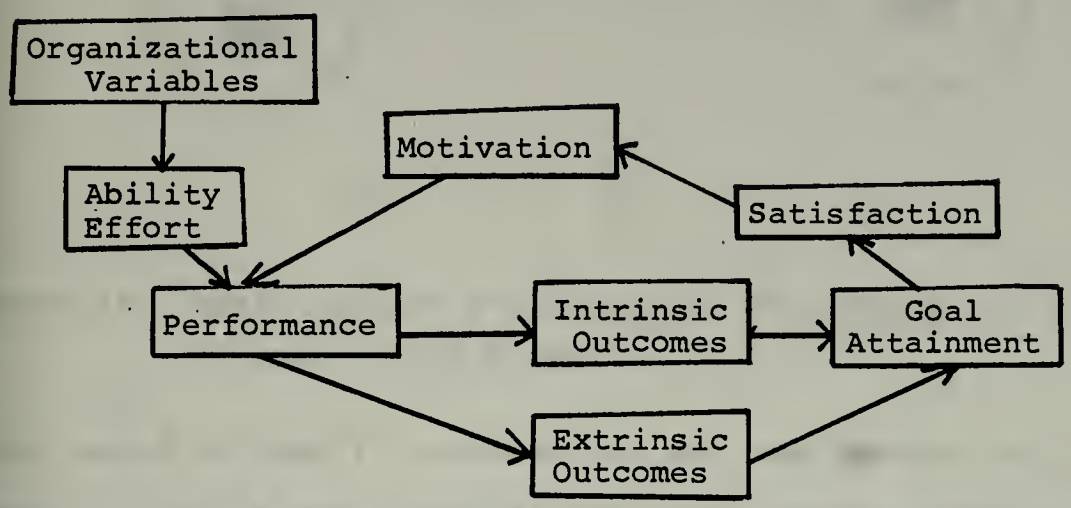

Figure 13. An Integrated Model of Motivation. After Cummings and Schwab, 1973.[14]

The aspect of human energy is closely related to motivation. Suppose two persons, X and Y, with exactly the same potential of energy resources, have to carry out a task. X is strongly motivated to do the job; Y is not. In Figure 14 the outer circles indicate their total energy resources, while the inner circles symbolize the energy available for their assigned tasks. After a while they have each used a certain fraction of the available energy (shaded part). Even though Y has burned less energy is absolute terms (area of shaded part), he has used up a greater portion relatively speaking. Therefore, subjectively he will feel more tired than X.[6]

Next, let one individual be assigned two different tasks. Figure 15 tells that the person is very tired (even exhausted)

Figure 14. Ratio Between Available and Used Energy and Subjective Fatigue. From Bjoervik.[6, p. 234]

with regard to Task I. However, he has some energy left for Task II. Only a small part of the energy used on Task I influences the availability of energy for Task II.

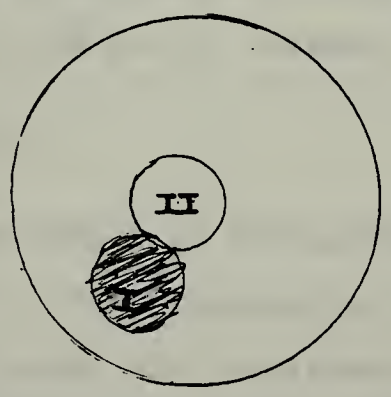

Figure 15. Ratio Between Fatigue in Connection with One Task and Available Energy for Another Task (Subjective Fatigue). After Bjoervik.[6, p. 235]

Considering the last illustration, it seems reasonable to conclude that variation in job assignment or rotation of task, may be a necessity from a pure energy point of view.[6] This observation brings up the question of job design and enrichment. Thorsrud and Emery[47] have listed the following psychological job requirements:[8, p. 246]

(1) Content and variation.

(2) Job requirements should be known.

(3) Something to learn.

(4) Something to decide.

(5) Job respect.

(6) Job-connected with the surroundings.

(7) Desired future (included no promotion).

Presuming that the frigate has finished the basic training period, it should be ample opportunity for any innovative CO or officer to find ways to apply the principles listed above. In brief, the ability to utilize the potential of human energy depends just as much upon imaginative thinking as upon insight and understanding of motivation theories. That quite naturally leads the way into the art or science of leadership.

6. Leadership

Within the domain of leadership, there are several major schools of thought. Their approaches to the analysis of the functions of the leader vary considerably. An excellent survey is given by Stogdill in his "Handbook of Leadership."[45] The author regards the contingency approach to be the most fruitful way of attacking the problem from an applied point of view. In accordance with that, a presentation of two of the leading contingency theories are given in Appendix A. The practical usefulness of each one is examined and compared. For further discussion, see Appendix A and references [19, 51]. Vroom and Yetton[51] single out three factors which they claim is especially

important in influencing the ultimate effectiveness of decisions:

(1) The quality or rationality of the decision.

(2) The acceptance or commitment on the part of subordinates to execute the decision effectively.

(3) The amount of time available or required to make the decision.

Any leader should understand the significance of these aspects of the decision-making process. It focuses on the fact that a decision which is clearly the best one according to some optimality criteria, might turn out to be hopelessly suboptimal and impossible to implement effectively because of poor judgment in selecting the decision rule.

Next, the usual military definition of leadership will be given. It is phased as follows:[55]

Leadership may be defined as the art, science, or gift by which a person is enabled and privileged to direct the thoughts, plans and actions of others in such a manner as to command their obedience, their confidence, their respect, and their loyal cooperation.

It seems reasonable to interpret the phrase "art, science or gift" as ability. Equally successful leaders in similar situations may vary substantially in the way they go about conducting their functions as a leader. No best recipe exists. Some succeed because they have special gifts, usually called charisma, which makes them natural leaders. Others become leaders due to

experience or special insights in a particular field or through appointment to positions which furnish formal authority and powers. In most cases knowledge in the subjects of social science will undoubtedly provide useful help to any leader.

A naval commander has tremendous powers, He even has the right and duty to undertake missions that may cost the lives of all his subordinates and his own as well.[49, 133, 115, 15, 247.2] The fact that lives are involved makes the naval leader's tasks quite different from that of a civilian manager. It adds an extra dimension to the consideration of moral responsibility.[1] This is the reason why a commanding officer has to demand absolute obedience and loyalty.[49, 115, 116, 120] It is a consequence of (1) the structure of the task, (2) the time element involved, and (3) the fatality of failure.

Even though a CO is given his formal powers by appointment, every person with such authority has to earn the confidence and respect of his subordinates to become leader in the meaning of the military definition. It requires the ability to be absolutely authoritarian in the structured situations and at the same time be flexible enough to allow maximum participation from everybody when no such constraints are present.

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[1]This aspect is superbly treated by H. H. Kirst in his novel, "The Nights of the Generals," Ch X.[31]

Any CO should always work hard to improve his own qualifications to tackle his part of the job. He also has the responsibility to ensure that his subordinates know their tasks, and are trained properly to match the requirements of their positions.[49,§§117, 126]

When the officers, and the CO in particular, show that they care for their men and take their business seriously, it should not be too hard to succeed in producing a reasonably effective unit. The sailors expect that their leaders (1) do their best to learn to know them, (2) guide them when they are ignorant, (3) punish them for wrongdoings (4) recognize jobs well done, (5) reward them for excellence, (6) respect them as individuals, (7) protect their integrity as human beings, (8) give them fair treatment.[49,§§115, 116, 119-123, 126, 127] The NAVREG paragraphs referred to is not much more than formalized common sense and observance of an acceptable code of behavior. Concerning suitable conduct, NAVREG[§ 129] explicity talk about the use of alcohol. Unfortunately, the drinking customs of the Navy are quite different from those recognized as respectable by many social groups in the Norwegian society. There are quite a few people of officer rank who have been in the Navy for such a long time that they fail to consider this point. According to the Leadership and Education Manual,[16] conscripted sailors do not expect their officers to be any kind of supermen. However, they do react negatively if their leaders are observed senselessly drunk even though it is on their spare time. Most of them will associate such kind of behavior with the local drunkards they used to see back home. And that comparison is no basis to

build respect and confidence upon. With the possible exception of a few leaders given extraordinary charismatic powers, no officer who really takes his responsibilities seriously can afford to ignore the importance of certain accepted norms that the civilian population and many of the conscripted sailors value highly. Such violations will always have negative consequences for the individual leader involved. It will also hurt the reputation of the Navy as an institution. Even the best ones could have been even better if this fact was observed.

In the present reality, the military definition of leadership has the weakness of focusing too much on the leader's position. His authority and its powers could almost be interpreted to have divine qualities. However, many individuals react very strongly at the bare possibility that the formulation might be based on such reasoning. Besides, the definition implicitly supports the so-called X-theory of McGregor[37] which assumes that there are people of two categories so to speak, the leaders and the followers. That point of view is not acceptable to most members of todays Norwegian society, even though absolute subordination obviously is required between the levels of hierarchy and authority present on the frigate.[14, §151, §153]

A naval leader probably should focus more on his duties and responsibilities than on his privileges to be successful.[23] If he for example uses his position to stay in bed after all his subordinates are required by the routine to be at work, that will hurt his position as a leader. Especially if this occurs frequently and maybe is due to his drinking too heavily the

night before. Any leader that does not follow the rules by which he demands his subordinates to live will most certainly experience difficulty in earning respect and confidence. A strong point of the given definition is that it explicitly states some basic conditions that are necessary to succeed as a leader. Accomplishment can only be achieved through the dedication and ability of followers. Hence, the style, attitudes, and values of the leader (i.e., his personality) play a decisive part in the leadership function. Fiedler[19] has tried to capture a combination of these effects in an aggregate personality measure he calls the least-preferred co-worker (LPC) score. The extreme points of his measurement scale is task orientation and relation orientation. (See Appendix A or reference.) But Fiedler's approach is not static, he considers the interactions with group as well as the structure of the task. An alternative definition of leadership that takes the dynamic aspects into account is given by Tannenbaum, Weschler and Masaryle[46, p. 24] and goes as follows: "Leadership is interpersonal influence, exercised in a situation and directed, through the communication process, toward the attainment of a specified goal(s)." Hence, the definition suggests that leadership involves attempts on the part of a leader (influencer) to affect (influence) the behavior of a follower (influencee) or followers in a situation.

The CO may regard this definition as a guidance for everyday leadership in the subsystem that has been called the technical-organic. Basically, this constitutes the application

of proven administrative techniques, experience rules of thumb, good judgment, flexibility, and common sense to build the basis for respect and confidence required by the military definition. However, the military definition should also be remembered to remind the CO of his unique responsibility as compared to that of the manager, his right and duty to complete his mission at the cost of human lives.

All the schools of thought in the area of leadership have something valuable to contribute to the overall understanding of how to go about achieving common goals. Hence, leaders should study and pay attention to all contributions, their approach, and points of view.

However, it is equally important that the leader:

(1) Understand his own motivational structure as well as his strong and weak sides as a leader. In that process Fiedler's LPC-score measurement can be helpful.[19]

(2) Develop his ability to integrate and apply his knowledge in a practical situation. That is where the simplistic model of Vroom-Yetton can prove to be very useful.[51]

This discussion of leadership has been very fractional. However, the purpose has been to show that there is no simple road to follow to be a successful leader. But as a rule of thumb it seems reasonable to expect that:

(1) consideration and respect for the integrity of followers,

(2) compassion for the needs of subordinates,

(3) geniune dedication to the mission given,

(4) professionalism in the "technical" aspects of the job,

(5) hard and determined efforts to achieve the stated goals,

(6) knowledgment of own limitations, and

(7) belief in the ability of the subordinates

in most cases will yield satisfactory results for the CO. Furthermore, it should be quite obvious that two of the most likely paths to failure for a CO are to put too much one-sided emphasis on:

(1) the organizational goals (and ignore the needs of subordinates).

(2) having a good time and happy relations (without, at the same time, stressing imposed or implied objectives enough to give the crew an opportunity to become professional).

Summary

The examination of organizational variables started with a discussion of structure which was defined as "relatively stable patterns that exist over time in a system." It was shown that some of the most vital functions of the frigate require rigid command structure to meet the time constraint imposed by the requirements of the situation. It was also suggested, with support from published research findings, that such extreme structure implies mechanical organization. Since there is no freedom of choice for the operators at the bottom of the chain, nothing is left to be decided and lack of firmly established procedures will, therefore, only tend to create dissatisfaction.

However, when the objectives are explicitly and clearly stated, it seems to be much easier to establish meaningful cooperation with subordinates since everybody has a common frame of reference.

Thereafter, the goal-setting process was considerd. Of special importance was the fact that unambiguous objectives tend to increase the autonomy of the individual officer. He is told what, but not how. Concerning areas where goals were not precisely defined as operational objectives, those involved could be viewed as searching for a common agreement that would provide a minimum benefit to all participants.

The third aspect discussed was the communication process. It was pointed out that channels can be one of two ways, and that to listen is just as valuable as speaking. Perceptual bias was also considered.

However, the main emphasis was on the presentation of a few hopefully relevant and illustrative examples in relation to the frigate.

Next, a very brief introduction was given of the process of decision making followed by motivation considerations. A very broad overview of the theories of Maslow, Herzberg, and Vroom were presented and some implications discussed. Expecially the importance of concrete feedback and the fact that motivation is individually determined. The latter aspect was illustrated through a brief discussion of the human problem of energy which in turn suggested job enrichment through job-rotation as a reasonable approach. Finally, some observations regarding leadership were made. It was pointed out that a

broader presentation of two important theories can be found in Appendix A. The important factors to remember in decision making were:

(a) rationality of decision.

(b) implementation.

(c) time available.

Two definitions of leadership were given, one of which was the most used military one. Some implications of this definition were examined. It was found to be quite static, but provides good guidance as to what underlying conditions have to be met before success as a leader can be expected. The dynamic definition emphasized the interpersonal influence in a situation to reach a goal. Finally, an attempt was made to show that there is a profound difference between management and military leadership based on the fact that a CO has the powers to obtain his goals by sacrificing human lives.

This summary concludes this section concerning models of organizational behavior as applied to the frigate. In the continuation the main effort will be put into presenting various organizational development techniques and schemes the CO can consider to apply to improve the output of his ship.

IV. TIME-PHASED ANALYSIS AND SYNTHESIS

In the preceding sections many theories and models have been introduced and applied to the analysis of the external and internal organizational environments of the frigate. Even though it has been emphasized that the observations made by no means guarantee the correct answer to the question of how to obtain optimal efficiency, an attempt will be made in this section to integrate the insights gained into an organization development (OD) scheme based on time-sequenced phases. The point of view will again be that of a CO trying to fulfill his mission.

However, before starting to develop the time-phased approach, the question of a unified leadership policy within the Navy as a supersystem ought to be considered.

A. SUPERSYSTEM LEADERSHIP PHILOSOPHY

There seems to be a need in any large organization to continuously review the policy of delegation of authority. There should always be harmony between the responsibilities of a position and the actual authority given to the occupant.[23] Hence, the Navy should closely watch its policy concepts regarding command of warships.

During World War II Admiral E. J. King worked very hard to make his flag officers and other force commanders appreciate

the vital importance of training commanding officers under their command to show initiative and take the responsibility for independent action. He stressed that officers in a position of command never should be told "how," only "what" and maybe "when" and "where." In addition, "why" should usually be added to ensure intelligent cooperation. He pointed out that if such officers are not given the opportunity to think, judge, and decide on their own in peacetime, they will get accustomed to detailed instructions and will be afraid to handle situations without specific orders in time of war. Admiral King, furthermore, asked his flag officers to be satisfied with acceptable solutions even if they did not meet the requirements of perfect, formal staff work.[40]

It may be that Admiral King's viewpoints are even more valid today. It is technically possible for a Naval commander to have the radar picture of his ships transmitted directly to his command center. He may, therefore, at his own discretion overlook, say, the navigation of any ship in his area. Monitoring of this type combined with detailed operational orders removes decision making requirements from the commander at sea. This type of operational environment will very likely result in COs with little ability to judge a given situation independently and take appropriate action. The question of incentives for the CO which are not in conflict with the real requirements of the organization as discussed in Section IIIB is of central importance.

Any development in the direction of excessive monitoring should continuously be watched carefully in the Navy. Actually,

there have been questions related in consequence to this problem in the RNoN. A few years ago, the outcome of trials in court of COs who grounded their ships seemed to be quite arbitrary. This was mostly due to the fact that such cases came up in different jurisdictional areas and the lack of a common understanding of the difference between a warship in a tactical exercise and a merchantman underway from A to B. Since then a commission has been appointed to treat all major incidents where warships are involved in order to ensure fair and equal treatment. Each year the commission publishes some of its findings. These selected examples function as guidelines. The commission has paid attention to such aspects as presented above as it should. It is a fact that for several months each year the Norwegian coast is stormy, dark, and unfriendly. Very often there is plenty of snow, rain or fog. These are the environmental factors the Norwegian Navy will have to face in time of war. One of the advantages this Navy is supposed to have compared to a possible intruder is the knowledge of the leads and training in utilizing acquired insights to tactical advantage. However, the development of such very practical skills heavily depends upon the realism that is allowed the Naval officers in their conduct of exercises. If the rule is to penalize severely for accidents even if they happen only occasionally, the COs obviously will become careful and first of all concentrate on safety before any training benefits of responsible calculated risks are considered. Even though reckless action never can be approved and hence has to be condemned, the Navy probably would significantly

benefit in efficiency in the long run from a rather liberal policy regarding groundings and similar happenings. Such random accidents should be viewed as an unavoidable part of a realistic program to develop COs of tactical excellence.

Considering the question of unified leadership philosophy, the Navy should perhaps consider allowing the Inspector General of the Navy and a few top operational Navy commanders to take part in a two or three day seminar with officers due to have important commands at sea. Participants ought to be designated squadron and division commanders plus captains of frigates and other larger craft of the Norwegian Navy. A seminar like the one suggested could provide inspiration and give a sense of purpose to participating officers. Case studies also tend to give the members of the work group a close to common perception of how to analyze problems that resemble the ones examined. In fact, it has been suggested that learning is a conditioning of future responses. Hence, a program as proposed could enable the Navy leadership to influence future actions of the participants indirectly. At least, the introduction of a CO's preparation seminar should increase the probability of coherency in the Navy's reactions to similar stimulus situations.

Summary

The Navy leadership should recognize the need for COs who are independent and determined in the conduct of their duties. In this context it is of crucial importance that each CO sees

his mission in the correct perspective. It should be understood that unnecessary, detailed instructions and monitoring very likely may develop cautious, relatively insecure leaders who would tend to wait for further orders instead of acting on their own judgment. If such bureaucratic attitudes dominate the oeprative leaders of the Navy, it most certainly will have a significant detrimental effect on efficiency and confidence of the Navy's capabilities. Therefore, a CO preparation seminar should be considered.

In the following section some of the major problems a new CO has to face on assuming command will be examined. The reader should throughout this section refer to the relevant parts of preceding discussions.

B. DEVELOPMENT OF THE FRIGATE AS AN ORGANIZATION

Before considering how the results from preceding examinations and additional recommendations from the NAVREG can be applied to develop a suitable organizational development (OD) scheme for the frigate, a summary of the task of the CO will be presented. Let E(X) represent efficiency and C symbolize the level of the frigate's total budget. Then the problem of the CO is:

$$\text{Maximize } E(X) \leq C \qquad X = (X_1, \ \ldots X_n)$$

$$\text{Subject to } g_i(X) \{\leq, =, \geq\} \ b_i, \ i = 1, 2, \ldots, m$$

where m is the number of constraints, n equals the number of variables (systems and functions), and b_i symbolizes expenditures

allowed or other limitations within various subsectors. For example:

$g_1(X) \leq b_1$ may indicate the approved number of gunnery shells of a certain caliber which is made available to be spent in practice during a certain time period, say, one year. The constraint $g_2(X) \geq b_2$ could represent the minimum required hours of leisure time an officer is entitled to have in a row each week. In other words, the CO's problem is to maximize efficiency within the feasible region left when all different constraints have been accounted for. Hence, the less leadway the Navy and other supersystems offer him, the less likely it is that he will think and decide independently and act forcefully in accordance with the situational demands.

The situations facing the CO can vary. For example, he may assume command at different stages in the life cycle of the frigate. The ship can either just be ready to leave the shipyard as an entirely new construction or it may have finished a refit period, or it can be in, say, the start of its operational phase. For each case the problems the CO has to handle will be different. Likewise, the manpower resources available will deviate in quality.

In the discussions in this section the following scenario will be selected (other possibilities will not be presented):

a. The frigate has completed a programmed refit period.

b. Officers and petty officers arrive a few days before the ratings.

c. Standard operational objectives are provided for all functions and systems.

d. All officers and petty officers have a basic theoretical background in social science subjects either through courses during basic training or they have attended leadership seminars in ongoing Navy programs.

The CO may find the input-output model helpful with regard to the task-oriented discussion of his leadership problem. This model (Figure 6) can easily be extended to include the dimension of time. Then the model serves two purposes:

(1) It can be applied at every transient stage of development to evaluate output against expected performance in that phase.

(2) Through the subsystems of coordination, control, and maintenance, progress towards the goal of establishing an operational unit of required standard can be continuously monitored, and weak areas can be identified and subsequently strengthened in the pursuit of the fully developed frigate.

Considering the human relations aspect, the Systems Level Model could provide a useful reference for the CO. This model focuses on the fact that to be concerned only with accomplishment or only with human relations probably is not the best way to proceed (Figure 3).

In brief, a new CO has to pay attention to many constraints. Hence, it would be valuable for most captains to have developed a general strategy of how to go about fulfilling the objectives expected of him. Such a strategy is called an organizational development (OD) model and is usually divided into development

phases. The discussions of models and variables of the frigate should, when combined with experience and the recommendations of the NAVREG, supply a reasonable platform on which any CO should be able to base his own plan.

It will be presumed that the CO has identified some major stages in the evolution of the frigate's capabilities and that he has decided on a stepwise, sequential approach with different emphasis on priorities in the various phases as illustrated in Figure 16.

1. Basic Decisions of Policy

The CO has to make up his mind regarding how he, in general terms, wants to go about running the ship. For example, he has to consider the need for a dual leadership function. Therefore, he should consult with his XO and determine at least broadly how he wants their functions divided between them. Any CO has to acknowledge that the way he involves the XO will have a profound influence on their relationship and leadership roles. The processes of communication, goal setting, and decision making as well as the establishment of structural patterns will very much depend on his attitude toward the status of the XO. The discussions in Sections IIIA, IIIB, IIIC, and the NAVREG, Part I, Chapters 1 and 3, have a strong bearing on the problems of this phase.

2. Establishment of Teamwork Among Officers

Next, the CO has to give initial guidance to his officers. Basic patterns of leadership and structure plus the freedom of

Frame Factors	Development Stages of Frigate	Emphasized Areas
Mission. Experience. NAVREG. Other constraints.	PHASE 1 Basic decisions of policy.	Personality and style of CO. Quality of leadership. Processes and variables.
Objectives. Quality and experience of officers. NAVREG. Other constraints.	PHASE 2 Establishment of teamwork among officers.	Basic guidance. Degree of autocracy, consultation and participation. Autonomy of officers.
Objectives. Quality and quantity of resources. NAVREG. Other constraints.	PHASE 3 Group development and implementation of policies.	Development of primary groups. Fundamental drill in functional skills. Watchkeeping duties. Adjustment to the warship environment. Feedback and drill.
Objectives. NAVREG. Constrained Resources.	PHASE 4 Growth of groups and intergroup relations.	Further development of groups. Intergroup competitions. Establishment of secondary groups. Introduction to stated objectives. Reinforcement and change of behavior. Use of sanctions. Feedback and drill.
Objectives. NAVREG. Constrained Resources. (Sailings)	PHASE 5 Internal participation and cooperation with other units.	Participation using objectives, welfare. Role of Board of Advisors. Job rotation. Development of l'esprit de corps. First external inspection. Feedback and drill.
Mission. Standard. Objectives. Operational and resources constraints.	PHASE 6 Operational period.	Consolidation and routine evaluation. Integration of new crew members. Increased participation and job rotation. Change of operational command. Feedback and drill.

Figure 16. Development of the Frigate as a Combat Unit

action of the officers within their areas of responsibilities have to be established in broad terms. During this phase at least the following policies should be resolved:

a. Standard introduction program for the ratings covering general norms and rules of behavior, emergency procedures, basic combat readiness requirements, watchkeeping duties, etc.

b. Responsibilities and authority of the Officer of the Watch at sea and in harbor.

c. Formal communication structure for various classes and types of information.

d. Procedures for planning of exercises, sailing and maintenance programs, debriefs, etc., between the CO/XO and the officers.

e. Broad guidelines for similar formalized briefs and feedback sessions wtihin divisions and departments.

f. How should bad conduct on behalf of the sailors be reported and investigated for the purpose of disciplinary action?

g. Apart from the required meetings, what should be the use of the Board of Advisors? What type of problems should be referred to the Board, and which ones should be handled administratively through the chain of command?

The above represent a small sample with many other important areas requiring consideration. The CO can choose between many different approaches to establish the policies he wants. He should pay close attention to his own personality characteristics, his usual style, and most significantly, how

he wants to accomplish his mission. A few possible options open to the CO will be presented. However, before he decides, the CO should carefully study Part I, Chapter 5 and 5 as well as Part II, Chapters 3-10 of the NAVREG and make the officers do the same.

a. He could simply submit detailed written orders and mainly deal with his officers through the XO in business matters. This approach will create a distant CO and put the XO in the power position. The latter can determine what the CO shall know (at least to a certain extent) by filtering information. The other way around he can interpret and modify orders and information given by the CO to be passed on.

b. The CO can lecture his officers in an attempt to sell his program. He may supplement this by answering questions and by giving out written orders as well. He will have interaction with his officers, but the communication will mainly be one sided. Hence, there is a strong possibility that the CO will run the show and that he may develop a group of followers lacking the initiative and will to take individual action.

c. He could invite the officers to participate in the development of policies under his and the XO's supervision. The CO can basically go for one of two approaches here. He can either accept a concensus type of proposal as a policy, or he can regard any recommendations as a suggestion and always reserve for himself (or as specified by his delegation of authority for the XO) to make the final judgment as to which alternative to choose. Practically, one way to go about this is the following:

(1) The officers are divided into work groups.

(ii) Each work group can study problems related to the area where a policy is to be implemented (prepared by XO/CO).

(iii) Groups present their proposals.

(iv) Discussion, generalization, and conclusion.

In addition to activating the officers, the discussions may develop rules and norms that they feel more obligation towards than otherwise would have been the case since they have participated in developing them. Hence, subjects like the following ones could be useful to address in the groups:

(a) What is required of an officer's behavior and his drinking habits?

(b) If possible, come up with a proposal to establish improved policies in the area formerly covered by the old CO Policy Order #5. (By treating all important orders this way, the CO has a pretty good guarantee that his officers understand the spirit as well as content of his orders.)

It has been hypothesized that learning tends to condition future responses. Hence, it appears that this approach might help to establish a basis for coherency in policy interpretation among officers.

Additional benefit could be obtained from this approach if the CO and the XO discretely observe the groups at work. It is the experience of the author[1] that the information gained about

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[1]The author worked with group development as an instructor at the Norwegian Naval Academy.

individuals when watching their behavior in a work group is quite astonishing. Besides, the officers themselves probably would learn to know each other quite well in a few days of group activities.

3. Group Development and Implementation of Policies

In this phase the ratings will arrive and the implementation of the policies decided upon will start. There will be a program of the day and a program of the week to be followed. Emphasis will be on:

a. Introducing the new sailors to the unfamiliar environment through the programs prepared during Phase 2.

b. Attempting to develop the formal groups into becoming primary groups for the sailors as discussed in detail under the presentation of the systems level model.

c. Teaching the sailors the fundamental skills in their primary combat roles plus the basics of their watchkeeping duties. Introduction to the importance of drill.

It is necessary in all phases that the CO, XO, and the officers supervise closely at their respective levels since feedback is of such importance for learning. However, at this stage careful monitoring is crucial. All possible measures should be taken to maximize participation in scheduled activities by superiors. That way, control and coordination can be kept tight enough so that deviations from agreed policies can be discovered and corrected immediately.

Reference should continue to be made to NAVREG, Part I, Chapters 5-7, and Part II, Chapters 4-7.

4. Growth of Groups and Intergroup Relations

It was anticipated during the examination of the needs of the crew that as soon as the ratings feel relatively secure they will start striving for belonging and status. The internal development of the groups is still very important and should always be watched closely. In addition to the factors mentioned in the discussion of the group as a system level, the CO should look out for technical and administrative improvements that deprive the officers of opportunities for natural interactions with their subordinates. One example could be that more "efficient" schemes have been implemented to pay the sailors their monetary allowance. According to NAVREG (§605), each department head is responsible for collecting the money and handing it out to the individual sailors in his department. This is a very favorable situation to meet with the crew members. He may initiate some small talk, ask the sailors how they are coming along or about their families. In short, it is a possibility to get better acquainted that should not be abandoned in favor of claims of efficiency. In fact, if implementated, centralized payment might be an example of suboptimalization.

A second case could be if a junior officer serving as assistant to the XO has to investigate all bad conduct reports regardless of department. For the officer involved, such an assignment could become a major part of his duties. It could be administratively efficient in a bureaucratic sense, but it would deprive the division officers of an occasion to take care of their men, be helpful, and show concern. Another aspect carries

even more weight; it is the fact that the officers lose an opportunity to acquaint themselves with the individual situation involving their men. Hence, from a leadership point of view, the division officers should take care of the investigation of misconduct of their own subordinates. The XO will have to supervise to ensure fair treatment. However, that can be accomplished by always requiring a written explanation signed by the offender and his division officer. Department heads should probably also interview each one of their troublemakers. In such cases strict procedures might have a preventive effect in themselves, showing that the officers care and try to find out what the sailor's problem is. Besides, it indicates that bad conduct is taken seriously by all superiors.

In order to maintain a favorable, within-group development, intergroup competitions should be encouraged in sports and other areas of welfare. This is also a good time to try to establish a ship's band and to organize secondary groups like soccer teams, bridge club, etc.

Likewise, in the functional areas the sailors should be acquainted with the operational requirements of their system by being introduced to the specified objectives. Integration of individual efforts should begin to take shape through increased coordination. Drill should be stressed in all programs to make the sailors become professional in their duties. However, performance should still be evaluated at the single ship level and single ship activities given priority. Desired behavior should be reinforced as much as possible. On the other hand, explanations

have to be applied to correct poor performance due to misunderstanding and lack of knowledge. However, willful wrongdoings should be punished by consistent use of appropriate sanctions. In this phase sailors will typically try to ignore the uniform of the day order, and cooks will not bother to change to proper attire before entering the deck to look at the scenery when the frigate is proceeding out or into harbor. These are minor offenses, and the officers often find it difficult to motivate themselves to care. However, it is an experience which many officers share that if the uniform rules and other individually, relatively unimportant things are enforced absolutely, other requirements often seem to be met more easily, with less effort, and hence more effectively. As a rule, it usually helps to keep the officers more eager if the XO, each time he discovers violations, not only corrects the sailor, but also consequently confronts the responsible officer with a question why.

5. Internal Participation and Cooperation with Other Units

At this stage debriefs and planning sessions should always be conducted with reference to stated objectives. Shortcomings should be pointed out and alternative training schemes should be considered in order to improve performance. All possible efforts should be made to engage the ratings in this process. Evaluation of own performance and participation in the planning of training activities including suggestions regarding priorities should provide ample opportunities for interested crew members to influence programs. Likewise, crosstraining and

job rotation ought to be started for reasons explained in the examination of the human energy problem in Section IIIC.

If the CO finds it suitable he could also consider delegating more specific authority to the Board of Advisors. He could, for example, put the Board in charge of introducing different unit symbols and to start a ship's newspaper. The need for identification with the unit will increase since the emphasis in exercises will shift from single ship activities toward cooperation with other units.

At the end of this phase a first visit of a team of inspectors would be appropriate. External feedback would provide a basis for a critical review of policies and programs. Weaknesses in important details may easily be overlooked in internal evaluations simply because of habit.

6. Operational Period

The five first phases may be said to constitute a basic training period. The frigate starts its operational life in the sixth phase. Considerable improvements are still possible in many areas, especially regarding routine and professionalism, but the frigate usually functions reasonably efficiently as a fighting unit at this stage, both internally and as a part of a combat force. Presuming satisfactory leadership, the operational cycle is characterized by a steadily maturing of the crew and a parallel consolidation and improvement in overall standards of performance. More and more procedures and functions will become routine and the maintenance of motivation will emerge as

a central problem. The emphasis on participation and job rotation programs has to be increased to meet this challenge. Support and encouragement should also be given to all initiatives aimed at creating additional meaningful leisure activities for the crew members.

Internal as well as external evaluations should be integrated stages in this phase. The evaluation process should be repeated on a cyclic basis, say, monthly.

However, each time there is a change of crew members, the pattern will be interrupted and a loop backwards is necessary to train the newly arrived in basic skills that the other crew members already have acquired. This is a major problem area of the operational stage. Hence, it is estremely important to have a proper introduction program to ensure rapid integration of new sailors. First of all they should be made to feel welcome and secure. Usually it would be a good approach to let the sailors in their group explain the functional aspects of their jobs. In that way, everybody can indicate their own domain and make the process of establishing the informal hierarchy in the group as short and painless as possible. Every officer should be aware of the fact that a power struggle for status positions always takes place when new members arrive. Actually, it would probably be an excellent participation scheme to let each division work out its own detailed introduction program within the framework of a CO order giving the general guidelines.

The introduction and training of new crew members is the most important event in the operational phase besides maintaining motivation and ability to reveal weak spots through self

evaluation. However, change of operational command may also initiate new requirements and alter priorities. Area commanders could have slightly different views regarding objectives or the mission could be different as a consequence of operational conditions and environment.

The six phases presented above could just as well have been perceived and listed differently. Adjacent phases extend into one another and one phase is not necessarily finished before the next starts. The main point is that focus should be changed as the capabilities of the crew members evolve. Increasing abilities develop new needs of higher order to be satisfied. It is crucial to recognize this evolution to succeed in maintaining and improving the quality of output.

Summary

The mission of the CO was reviewed and presented in symbolic form as an optimization problem followed by a description of the scenario on which the considerations of the frigate's phases of development rest. Furthermore, it was presumed that the CO would apply the input-output model and the system levels model to guide him when preparing his strategy of organizational development; one model primarily useful for task-oriented evaluations, the other mainly applicable to the human aspect of the system.

The CO identified six different development phases. Figure 16 gives an overview of the various stages and the areas of focus in each phase. The phases were:

(1) Basic decisions of policy.

(2) Establishment of teamwork among officers.

(3) Group development and implementation of policies.

(4) Growth of groups and intergroup relations.

(5) Internal participation and cooperation with other units.

(6) Operational period.

Throughout each phase new crew members may arrive. That always creates problems and requires a return to more basic training to give the new sailors an opportunity to acquire all necessary skills. However, change of crew most commonly takes place in the operational period. In order to maintain effectiveness, a well-planned introduction program is invaluable. Last, the extremely important role played by drill and feedback in the process of producing efficient, confident, and professional crewmembers should again be pointed out.

V. SUMMARY AND CONCLUSIONS

In this section a brief overview of the study will be given followed by some concluding and normative remarks regarding lessons learned of how a commanding officer (CO) could go about integrating knowledge available from various sources of behavioral sciences and the General Regulations of the Royal Norwegian Navy (NAVREG). It represents an attempt to establish a scheme which is flexible enough to make it possible to maintain effectiveness even under conditions requiring substantial internal responses to satisfy demands caused by frequent changes in the external environment of the system which is subject to analysis.

A. SUMMARY

Initially it was hypothesized that profound and relatively rapid changes in the surroundings had created strong needs for internal adjustments in the RNoN. Old schemes that had worked satisfactorily before no longer suffice to produce efficient results. Major changes in value orientation in the general population and universal conscription have had an effect on the within-Navy environment.

The study was limited to a treatment of the situation of a commanding officer of a frigate in the RNoN. The intent was to analyze possible approaches that appeared to provide a reasonable

chance for the CO to accomplish successful completion of his mission under the given circumstances.

The analysis was based upon the following three assumptions:

1. The frigate as a technological system is given.

2. The CO is in change of a real life experiment called an identity simulation.

3. Organizational requirements cannot be met effectively if they prevent individual need satisfaction of the crew members.

First, an analysis of the frigate as a system was carried out. Background factors such as attributes of the social groups present on the ship were examined. The formal functional and operational organizations of the frigate were presented, and the influence of officer organizations and the Board of Advisors were discussed.

Next, two models of the frigate were developed. The system levels model provided a frame for discussions of individual need structure and need satisfaction (individual level), the social function of groups and group development (group level), and the purpose of the frigate as an organization (organizational level).

Thereafter, the social consequences of the given technological structure were considered. Indications were that the technological system combined with the objectives of the organization pretty much determine the social structure of the work system. Possible schemes to prevent or at least reduce the negative aspects of this observation were examined within the reference of a socio-technical input-output model. The effect of changes in factors outside the frigate was also taken into account.

Following this, theories concerning organizational variables and processes were presented and their applications looked at in

the context of the frigate. The content of Appendix A is closely related to the considerations of this section. In the appendix two leadership theories viewed as highly relevant are being compared and valued for practical application.

In the final part of the study, the task of the CO was viewed as consisting of a series of time-sequenced stages. Each phase identified was presumed to be subject to particular problems that should be given special attention and treatment. The previously presented models and recommendations from NAVREG were used to facilitate the analysis of difficulties and to provide guidance to what the proper action should be. In spite of this, no single, unique answer to the question of how to proceed could be supplied. Various alternatives were described and considered at each stage. However, the final responsibility for making the normative judgments must rest with the CO because he always has to take into account that choices should harmonize with his own abilities, style, and preferences in order to become successes.

B. CONCLUSIONS

It is by no means straight forward to state what the measure of effectiveness of a warship should be in peacetime. This fact quite strongly suggests the need for a clearly stated policy by the Navy leadership to provide the necessary purpose and guidance in this matter. The commanding officer should be told <u>what</u> is expected of him and his unit. Based upon the discussions of

these factors, it seems reasonable to recommend that the following programs should be given priority in the RNoN:

a. A seminar conducted at high level aiming at giving the COs a proper, current perspective of their mission.

b. The establishment of specific objectives for operation and maintenance of all functions and systems.

However, the individual CO will still have to consider in each case the resources made available to him including his own capabilities before he makes up his mind of how to go about developing his unit. Then, it is obviously important that he has a sense of direction and a correct understanding of his goals.

In his search for optimal solutions, theoretical models could prove to be useful support for the CO despite the fact that no such model can supply the final answer to the problem of producing the effective frigate. Models, however, provide valuable references within which to plan, conduct, and analyze experiments intended to bring about functional and social improvements. Models also furnish structure which facilitates communication of requirements and feedback of results. The presence of operational objectives are desirable for the same reason. Hence, it seems natural that the Navy should consider to:

a. Encourage and train COs and officers to use theoretical models, objectives, and NAVREG recommendations to establish organizational development schemes suitable for their own purposes.

b. Implement a system of inspection and supervision to supply external feedback by establishing functional teams of inspectors.

c. Educate high level officers to put proper weight in relevant areas when evaluating the COs, i.e., performance vs. objectives, so as to prevent misguidance by feedback stressing factors which do not contribute significantly to the overall readiness of the unit.

d. Introduce reward systems, proficiency certificates, and support competition to provide incentives.

e. Cancel or rewrite detailed regulations that unnecessarily interfere with the question of how a problem should be solved (that is the CO's mission). Rules that could actually hamper realistic conduct of exercises directly or indirectly ought to be put out of force since such directives could tend to develop undesired, bureaucratic personality characteristics in COs in addition to preventing them from properly acquiring abilities and skills crucial to have in time of war.

Besides, due to the fact that Norway has universal conscription and the liberal values held by the general population, special attention has to be paid to the development of the social system of the unit. Therefore, it is recommended that the CO and his officers should:

a. Acquire the basic view that the individual sailor is a unique person with special needs to be satisfied.

b. Recognize the usefulness of a stepwise approach based on time phases as described in Section IVD starting with guadually introducing the new sailor to the unfamiliar environment of the frigate, and

c. Be strongly encouraged to use all their innovative abilities to create and implement participation and job rotation programs which the sailors find meaningful and rewarding at the same time as their efforts work to the benefit of the frigate.

However, within the frame of their legal power, it is both the duty and the privilege of those selected to command ships at sea, to find their own way. Only those who have the final responsibility and authority can determine which recommendations and guidelines it is suitable for them to use.

APPENDIX A

APPLYING THEORIES OF LEADERSHIP
A COMPARISON BETWEEN THE CONTINGENCY MODELS
OF FIEDLER AND VROOM-YETTON

Traditionally it was common belief that some people were born with special kinds of abilities that made them become natural leaders. It was often supposed that these inherited skills would allow such a person to perform equally well as a leader in all situations. The consequences of this approach is the view that mankind consists of two basic types of people: the leaders and the followers.[37]

However, empirical results have shown that few people are always leaders. The character of the role a person plays changes. Most people assume roles as leaders as well as followers. Repairman Johnsen is in charge of no one at work, but on the baseball field he is in command as the expert coach. Officers who show up on practices accept Johnsen's supervision and leadership. This change of role is very well documented in literature. Hence, today the prevailing point of view is that no single leadership attribute assures good organizational performance under all circumstances.

The problem of understanding the factors which affect effective leadership has been approached from many directions. Hence, studies of personality trends, group behavior, sociology, motivational structures, characteristics of organizations and

the individuals and groups within them, and communication theory, just to mention a few areas, have all contributed substantially to the understanding of the leadership problem. Numerous schemes have been developed to improve the performance of leaders or to prepare future leaders. Often such efforts have been combined with attempts to motivate workers to achieve higher productivity applying various incentives.

In most cases, the approach has been partial. Experts in different areas tend to emphasize their viewpoints as the most valid ones. However, it seems that a model has to account for a lot of facets if it intends to be successful in accounting for all sides of leadership efficiency. Quite a few researchers in this area have been interested in the effect of the dominant motivation structure of leaders usually associated with needs for achievement and needs of affiliation.[19, 7] Several have found[19, 7] that the attitude the leader has towards achieving his own goals as compared with those of the organization is an important clue to understand leader behavior and efficiency. The extreme values on the bipolar scale between achievement and social needs motivators are usually referred to as task and relation orientation, respectively.[19] Many equivalent names are commonly used to identify leaders belonging to one or the other of these two categories such as "power orientation vs. personnel orientation" and "task specialization vs. maintenance specialization" and several others.

THE THEORY OF FIEDLER

One of the best known and validated theories of leadership is F. Fiedler's contingency theory.[19] Basically, Fiedler uses a test to determine the leader's score on the task-relation scale. This is very easily done by applying Fiedler's "least preferred co-worker" (LPC) test. From a set consisting of all present and former persons the subject ever worked with, he is asked to pick the one he least preferred as a co-worker. Having done this, the subject answers as best he can a list of attributes concerning this person. Each question has to be indicated on a scale with 1 and 8 as extremes.[19, p. 75] When the scores are summed, the subject's LPC index or score is obtained. Fiedler classifies leaders in two main groups: (1) Subjects who are not emotionally able to distinguish between attributes of the co-worker related to poor work performance and qualities describing the co-worker as an individual, gets a low LPC score. Those are the task oriented leaders. (2) Others who manage to see the difference hetween the co-worker as a person and a worker get high LPC scores. They are classified as relation oriented and are characterized by being more analytical and differential in perception and evaluation of their surrounding environment.

Fiedler interprets the LPC index as an indicator of whether a person's motivational hierarchy is basically achievement or relation oriented. Furthermore, he presumes that the leader not only pursues the goals of the organization, but also simultaneously tries to satisfy his own needs. Depending upon the

structure of his motives and their relative priorities, the approach to reach a certain goal may vary widely from leader to leader.

The Contingency Model was developed by analyzing the data regarding performance of different LPC score leaders in various situations. The theory that emerged from this study lead to the main hypothesis that effectiveness of leadership depends upon:

a. the way the leader interacts with his group members (style),

b. the characteristics of the group-task situation (favorableness).

The following three factors were found to describe situation favorableness:

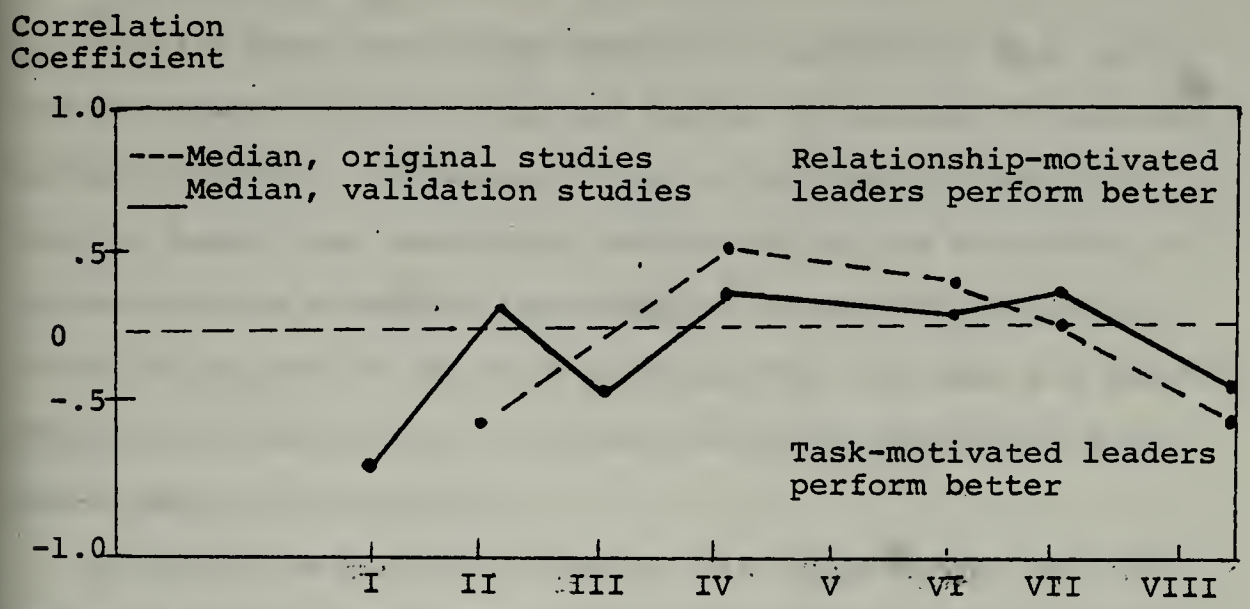
a. leader-member relations (Good - Poor).

b. task structure (Structured - Unstructured).

c. leader position power (Strong - Weak).

In Figure 17, the correlation between combinations of these three situation characteristics and leader performance, are shown.

Note that positive correlation indicates better performance by high LPC score leaders, negative tells that the task-motivated did the best job. As can be seen from the figure, the curves representing the original and validation studies, respectively, correspond pretty nicely. The correlation between them was found to be .86. The results strongly suggest that task motivated leaders perform best in very favorable and in unfavorable



Leader-Member Relations	Good	Good	Good	Good	Poor	Poor	Poor	Poor
Task Structure	Structured		Unstructured		Structured		Unstructured	
Leader Position Power	Strong	Weak	Strong	Weak	Strong	Weak	Strong	Weak

Figure 17

Correlation between leader LPC scores and performance in various cells of the situational favorableness dimension. After Fiedler from Fiedler and Clemers.[19, p. 84]

situations, while relationship motivated leaders are found to do best in moderately favorable situations.

The conclusion seems to be that the universally perfect leader is rare, indeed. Interpreted another way, however, anybody who is placed in a leadership situation that matches his leadership style may excel given he has the necessary background to fill the position. Because of the predictive power of the contingency model, it seems reasonable to assume that a sub-

stantial portion of the behavior pattern in leadership situations is determined by the person's LPC index.

We also know from other sources[3] that there is a correlation between leader style and leader efficiency in handling different tasks. Therefore, it is a very crucial question whether based upon continuous evaluation of the situation a person is able to adjust his behavior at will to pursue the goals he has set in the most rational way. Or does his behavior change unintentionally as a result of group interactions and hence outside his control?

It cannot be seen that Fiedler has investigated the consistency between predicted leader style (expectations based on LPC scores) and the behavior actually used by the leader in different situations (based on observation). Those with extreme scores at both ends of the scale, supposingly, would behave approximately as expected in accordance with their test results, while those who obtain scores closer to the middle of the scale might be anticipated to show greater flexibility and hence variation in their leadership style.

Despite the fact that the LPC score predicts fairly well, a lot of variation remains unexplained. One reasonable source of explanation could be that Fiedler overestimated the rigidity implied by the LPC index as a personality trait pattern. As pointed out above, it seems quite intuitive to expect that mature leaders in the middle range of LPC scores would tend to adjust their leadership style or behavior to fit the situation. It has been established through studies of group dynamics[18]

that effective output depends on a dual leadership principle. An element of task orientation as well as a component taking care of social needs of group members must be present to insure efficient work. Most of the time, the leadership is shared by two persons, one in charge of each aspect. It might be hypothesized that an experienced leader will sense which dimension is already taken care of and then adjust his behavior to supply the missing part. If such flexibility is present, efforts to train leaders and the importance of experience as learning processes may be viewed a little more optimistically in general than what Fiedler does. As pointed out by Fiedler, the fact that high LPC scores in some instances tend to deteriorate in their leadership performance as they gain experience may be explained by the fact that being fairly complex persons cognitively, routine and power positions provide little challenge and satisfaction to such individuals. Hence, when starting to become bored, high LPC leaders should be transferred. The low LPC type on the other hand, love to be on top of any detail, and when every aspect is structured or he has no fear of failing his goals, he can relax and become quite friendly.

Fiedler suggests that a leader should avoid situations where he, according to his LPC score, cannot expect to perform at his best. The weakness of this reasoning is the fact that most leaders are required to face all kinds of situations in which their positions demand that they act as leaders. Therefore, it is much more appealing intuitively, to develop schemes to train leaders to perform better in situations in which their usual

style is known to be inefficient. To succeed in this task requires development of two skills:

(1) enough insight to analyze the most important factors of the situation, i.e., provide a reliable situation diagnosis,

(2) ability to adjust leadership style or behavior so as to match the situation to improve the probability of obtaining the goals the leader is working to accomplish.

Research[43] indicates that such flexibility may indeed be present. In the military, the commanding officer and his deputy usually (81% of the time in the presented survey) divide the roles of the social-emotional leader and that of the task leader between themselves. It seems like say, the captain of a naval vessel indicates his interests and abilities and the second-in-command fills in the holes necessary to provide a complete leadership function. As we all may have seen, executive officers change their role by substantial adjustments in behavior, to match two different commanding officers. So the belief in flexibility may have some merit after all.

Therefore, it does not seem justified to write off the possibility that middle scorers of both categories may display flexibility in adjusting their leadership style to match situational requirements. In fact, there is some evidence that diagnostic methods are being used and that such insight has been applied rationally or intuitively to perform optimally as leader in the given circumstances.

When looking at the different situations displayed by octants in Figure 17, it would be rational for a moderately high

LPC leader (relation-oriented) to show relatively autocratic style in octant II. Since the task is structured, there is not very much to disagree about. This may also partly explain why the largest difference in median performance observed between the original and validation studies occurred here. In octant VII, there is only a slight indication of variation between categories. Since the situation attributes are poor, unstructured, and strong, two main approaches seem logical:

1. The leader structures the problem if he has enough information.

2. If he lacks insight or information and the group has the resources to solve the problem, he may have no choice but delegate to the group to work out the solution. Despite poor relations, such an assignment may turn out to provide an incentive for the group. Nevertheless, the leader has strong powers so he can easily tighten the control if necessary.

Various explanations may supply reasonable answers to the results obtained in octant VII, but assuming some leader style flexibility in the middle range scores, leaders of both categories could equally well choose any one of the alternative approaches outlined above. If this assumption holds, it is not surprising that variation in observed behavior within LPC category matches the variation between high and low LPC score leaders.

In summary, Fiedler's theory seems to suggest:

1. Assign leaders only to positions that match their potential (according to LPC score), i.e., the leadership situations they will experience are generally favorable.

2. Educate leaders enough in relevant areas so as to enable them to make situation diagnosis. From these two approaches suggest themselves:

a. Share leadership responsibilities essentially along a task function and a social-emotional function dividing line (CO/XO).

b. Leadership by substitution. The responsible leader assigns a subordinate assumed to possess the attributes the situation requires, to carry out the leadership function on his behalf. An example would be for a CO who is a poor shiphandler to delegate to one of his officers to secure the vessel along a pier.

Some of the conclusions that may be drawn from Fiedler's work are:

a. High LPC leaders seem to need challenge to be motivated. Hence, their performance may actually decrease with experience. This indicates that such leaders should be watched carefully and rotated when their performance starts to decline.

b. Low LPC leaders generally improve with experience. Training also help them to manage their jobs better. Hence, this type of leader should be kept in the same position for a longer period.

c. Different organizational positions require different skills. Structure tends to vary substantially with organizational level. This should be kept in mind such that a high LPC person is not put in a very structured line supervisor position, while his low LPC competitor is assigned to staff work in the product-development section.

VROOM-YETTON MODEL

Next, we will look at another leadership theory of some fame, the Vroom-Yetton Model. This theory provides a tool that may be used for systematic diagnosis of a situation and subsequent choice of action.[51]

The proposed procedure guarantees considerations about choice of leadership style or rather the managerial decision making approach to be used. It also takes into account relevant demands for decision quality. Briefly stated, the model is designed to determine which types of management decision process it is suitable to use in varying situations. Each of the letters "A" (Autocratic), "C" (Consultative), and "G" (Group) indicates the basic properties of the process in question. Roman numerals which follow the letters are attached to differentiate between variants of the main approaches. As a conceptual aid to understand the model, it is helpful to distinguish three main factors which significantly influence the ultimate effectiveness of decision. These are:[51]

1. The quality or rationality of the decision.

2. The acceptance or commitment on the part of subordinates to execute the decision effectively.

3. The amount of time required to make the decision.

In this context it is important to note that:

> "The results suggest that allocating problem solving and decision making tasks to entire groups, requires a greater investment of man hours but produce higher acceptance of decisions and a higher probability that the decision will be executed efficiently."[51]

The literature shows that the quality of the decisions arrived at varies a lot between as well as within categories. The same applies to the time used. Hence, it is not meaningful to make general statements about relative merit of group work as compared to individual effort in deriving adequate alternatives and selecting efficient courses of action. Going back to the Vroom-Yetton Model, its purpose is to assess the type of process the leader should apply to insure the highest possibility of success. The specification must be based upon an evaluation of the situational demands. In Table II, a summary is given of the codes and main features of the decison processes included in the model (Vroom, Yogo, 1978, 52).

Table II

TAXONOMY OF DECISION PROCESSES (STYLES)

AI - Decision maker (DM) decides himself using only information presently available to him.

AII - DM uses subordinates to obtain information, then decides on the solution himself.

CI - DM shares problem with relevant subordinates individually, getting their ideas and suggestions, but makes the final decision himself.

CII - DM shares the problem with the subordinates in a group meeting to obtain suggestions and clarify alternatives and consequences, but he still determines what to do. The decision may or may not reflect influence of his subordinates.

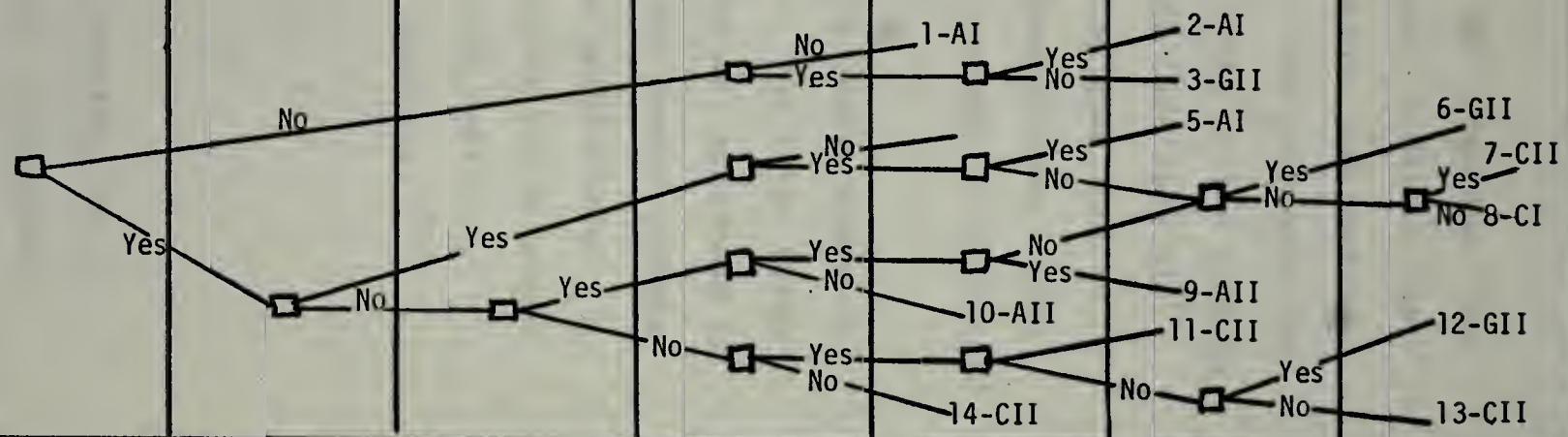
GII - DM shares problems with his subordinates as a group. The participants generate and evaluate alternatives and aim at reaching concensus on a solution.

To find the recommenced process (or processes) in a particular case, the leader must first diagnose the problem. This is done by answering yes or no to seven questions corresponding to situational variables assumed to partially explain the

Figure 18

Decision Process Flowchart[1]

	A	B	C	D	E	F	G
Situation Attributes or Variables	The importance of the quality of the decision	The extent to which the leader possesses sufficient information/expertise to make a high quality decision by himself	The extent to which the problem is structured	The extent to which acceptance or commitment on the part of subordinates is critical to the effective implementation of the decision.	The prior probability that the leader's autocratic decision will receive acceptance by his subordinates	The extent to which subordinates are motivated to attain the organizational goals being presented in the objectives explicit in the statement of the problem	The extent to which subordinates are likely to be in conflict over preferred solutions
Diagnostic Questions	Is there a quality requirement such that one solution is likely to be more rational than another?	Do I have sufficient information to make a high quality decision	Is the problem structured?	Is acceptance by subordinates critical to implementation?	If you were to make the decision by yourself, is it reasonably certain that it would be accepted by your subordinates?	Do subordinates share the organizational goals to be obtained in solving this problem?	Is conflict among subordinates likely in preferred solution?



[1]After Vroom from Kolb, Rubin, and McIntyre[51, p. 68]

effectiveness of the different processes. The responses (yes or no) describing the seven problem attributes, indicate the problem type. Having obtained this information, the feasible decision processes remaining are specified. The processes not in the feasible set, are considered inapplicable to the problem at hand. To use the model, one starts at the left side of Figure 2 and goes towards the right asking the questions in boxes A through G in the sequence they are encountered. Each terminal node contains a code telling which process is described for the problem type being investigated.

The seven rules underlying the diagnostic question are not arbitrary. They are of two different types. The first three rules are constructed as to protect the technical soundness of the resulting decisions. These are called the leader information rule, the goal congruence rule, and the unstructured problem rule, respectively. The last four rules are intended to protect the probability of acceptance of the decision. These can be summarized under the following headings:[52]

- the acceptance rule,
- the conflict rule,
- the fairness rule,
- the acceptance priority rule.

In Table III, the problem types and the feasible set of decision processes that correspond are listed. The number code for acceptance methods and problem type refers to Figure 18.

Table III

PROBLEM TYPES AND THE FEASIBLE SET OF DECISION PROCESSES[2]

Problem Type	Acceptable Methods
1	AI, AII, CI, CII, GII
2	AI, AII, CI, CII, GII
3	GII
4	AI, AII, CI, CII, GII*
5	AI, AII, CI, CII, GII*
6	GII
7	CII
8	CI, CII
9	AII, CI, CII, GII*
10	AII, CI, CII, GII*
11	CII, CII*
12	GII
13	CII
14	CII, GII*

*In the feasible set only when the answer to question F is Yes. Note: Figure 2 explains the number codes.

[2]After Vroom from Kolb, Rubin and McIntyre.[51, p. 71]

Whenever there are more than one method left in the feasible set, the choice among them might be done in any number of ways. The decision tree in Figure 18 is based upon selecting the one requiring minimum man-hours among methods of equally likelihood to meet demands of decision standard. But other criteria may be used as well. For example, if GII belongs to the feasible set, and the leader wants to develop his subordinates' ability to work in groups, he may go for this method.

The model has not been very well validated empirically. The evidence presented in the earlier works of Vroom and Yetton suffered from rather serious design deficiencies. However, in a recently published follow-up study,[52] valid support for the model is presented.

In addition to supplying evidence for the validity of the Vroom-Yetton Model, the analysis of the data also yields other interesting observations. In summary, some important findings are:

a. When the decision method applied belongs to the feasible set, the probability of successful result of the decision is significantly higher than when the method used is not included.

b. Furthermore, decision method (ignoring feasible set) employed can also predict decision success. CII and GII are found to be relatively effective overall (74% and 64% success rates, respectively). The results indicate that AI and CI are comparatively ineffective (24% and 45% success rate). This finding supports those who point out the advantages of participation per se without regard to situational factors.[52, p. 155]

However, the Vroom-Yetton Model has the additional discrimination capability of predicting those instances in which autocratic leadership has a higher probability of success, as well as those in which participative approaches will most certainly fail.

c. It should be pointed out that there is no guarantee of success when a feasible method is used, or any certainty of failure because the process applied is not contained in the feasible set. But the probability of success varies considerably.

d. Generally, the relationship between decision process used and resulting effectiveness of decision were found to be consistent with the rules on which the Vroom-Yetton Model is based. It might be mentioned that all of the three criteria

- overall effectiveness
- quality
- acceptance

were found to decline substantially with number of rule violations. The degradations were almost linear with rate clearly steeper for overall effectiveness and acceptance than for quality.

CONCLUDING REMARKS ABOUT THE VROOM-YETTON MODEL

It may be said that a lot of knowledge about human behavior in group and organizations, human role playing and decision making, motivations and many aspects of leadership are available today mostly in descriptive form. The Vroom-Yetton approach seems quite promising in providing a normative bridge between theory and practical life by integrating a lot of insight from different areas of social sciences into this relatively simplistic model. It is flexible and makes a lot of intuitive sense. The result of the validation studies are encouraging. However, when compared to the still much more thoroughly validated model of Fiedler, a few crucial points need further investigation. Efficient use of the Vroom-Yetton Model requires lots of flexibility on behalf of the leader after he has acquired the necessary diagnostic skills. From Fiedler's analysis, it seems unreasonable to expect extremely high and low LPC scorers to display any kind of efficiency in adopting different leadership styles. But for the leaders in the intermediate range, the Vroom-Yetton Model should provide a meaningful tool. Since the method is like an algorithm in structure, it most certainly should supply an excellent frame for analysis and discussions of cases, and hence become an important element of support in leadership training and organizational development.

CONCLUSIONS

From Fiedler and other sources, we know as a fact that nobody or at least very few, function equally well as leader under all circumstances. This is not likely to change even if the Vroom-Yetton Model proves to be close to perfect. However, the diagnostic powers of this theory combined with knowledge of own and subordinates' LPC score and experience, might enable say, the commanding officer of a naval vessel to make choices in leadership situations between more clearly understood alternatives. As shown before, this could include the decision to delegate general authority in certain areas to his executive officer or ordering one of his officers to perform certain duties as the situation demands and the officer concerned has the required skills.

Most certainly, neither Fiedler nor the others have found the final truth of leadership. But combined, the two theories discussed in this appendix provide insight as well as ideas that may be utilized by any leader to experiment by trial and error. Much deeper understanding and faster progress should be obtained when a leadership philosophy is anchored to a well-defined structure instead of being guided by random self-gained experience.

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